

Judging how far to squeeze

BY COLIN JONES

UP TO A POINT Mr. Peter Shore may have been on to something when he told local authorities that they should still be able to find ways of reducing their expenditure which would avoid redundancies. The latest analysis of their spending plans shows that just over half of this year's projected £300m. "overrun" beyond the figures agreed with the local authority associations last November arises from local rates subsidies for housing, bus and train fares, and local authority trading activities.

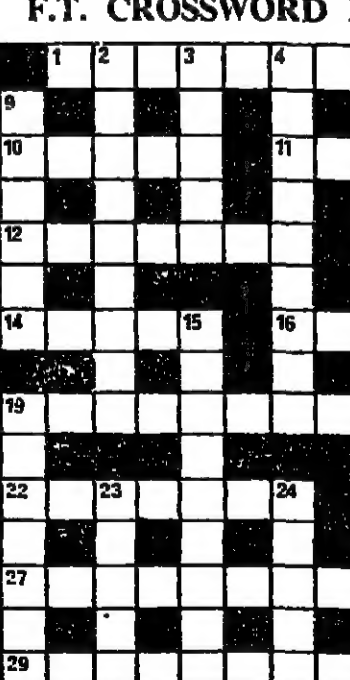
More pressing

Yet one suspects that it was not local profligacy with subsidies on much as more pressing political considerations which persuaded the Environment Secretary to tread circumspectly around the matter of redundancy. The continuing rise in unemployment has led to increasing resistance among the Government's supporters. The TUC annual congress takes place this week and the Labour Party conference is still to come. This is perhaps not the most propitious moment to provoke a clash with the more vociferous opponents of spending cuts, among whom are to be found public sector unions like the National and Local Government Officers' Association and the National Union of Public Employees. With luck, if the issue is fudged until after the conference season is out of the way, the underlying unemployment trend might then be showing signs of improvement.

Blow back

Indeed, the grant mechanism could easily blow back in the Government's face. If Mr. Shore squeezes local councils too far or if too many over-spenders choose not to fall into line, we could see another ratenayers' revolt next spring and Labour could have much to lose if the rates increase were made to seem the result of a central government decision rather than local over-spending. Mr. Shore will have to calculate nicely just how far he should squeeze. He knows that he cannot expect to achieve an acceptable level of rates increases, and still be able to avoid a major row with the public sector unions. His problem is that, because local authorities have autonomous tax-raising powers of their own, he may not even be able to ordain which of these three alms should be sacrificed.

F.T. CROSSWORD PUZZLE No. 3,175



- ACROSS**
- 1 Calm down and produce music personality (7)
 - 2 Ring bachelor assembly for a fixed date (8)
 - 3 Food taken after one's (5)
 - 4 Shares true revision in handwriting (9)
 - 5 Possess unusual pride initially but confess (3, 2)
 - 6 Tirade involved with oil on the leader page (8)
 - 7 The best in society, literally surrounded by Orientals (5)
 - 8 Craft or splendid ship going to the east (7)
 - 9 The start of terrorism with smoke rising is disastrous (6)
 - 10 Offers of marriage and support with love upset last (8)
 - 11 Agile, making airman pinch with a twitch (9)
 - 12 Bet on team left in and red (8)
 - 13 South-western city rising but it would cleanse (7)
 - 14 Shelf right for fish (6)
 - 15 Prude badly concealed (5)
 - 16 Everything belonging to me in wood (5)
 - 17 What is required to measure resistance (5)
- DOWN**
- 1 Calm down and produce music personality (7)
 - 2 Ring bachelor assembly for a fixed date (8)
 - 3 Food taken after one's (5)
 - 4 Shares true revision in handwriting (9)
 - 5 Possess unusual pride initially but confess (3, 2)
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The solution of last Saturday's prize puzzle will be published with names of winners next Saturday.

Northants win their first major cricket trophy

By Trevor Bailey

NORTHANTS BEAT the firm favourites, Lancashire, by four wickets in the 59th over of the Gillette Cup final before the occasion's usual capacity crowd at Lord's on Saturday, giving their first major trophy.

TREVOIR BAILEY

It is never easy batting at Lord's in September, but Northants were both back in the pavilion with only 17 on the board, but the worst blow was when Wood was again hit on his right hand and forced to retire hurt.

Arsenal and City disappoint

a lot of high expectations

WHILE the best things in London and Manchester soccer were happening elsewhere, Arsenal and Manchester City disappointed a lot of high expectations in a goal-less draw at Highbury. It proved, if proof were needed, that it will take deeds, not words, to transform the boring methodical Arsenal into exciting crowd-pleasers in concert with the new image one expects of a side managed by Mr. Terry Neill.

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Merit table of English rugby expected

IT WOULD seem that Twickenham was the scene of lively discussion on Friday when among other things the future nature of the county championship was discussed. It emerges that the Northern group took the firmest line and that the championship will stay for the present.

TREVOIR BAILEY

What seems odd is that the majority of players I have spoken to do not want it. However, I understand that an English merit table will shortly be instituted and this, the latest step forward, is perhaps a response to the Anglo-Welsh merit table now in force.

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Britain's big tennis hope beaten

NEW YORK, September 6

THE first four days of the \$416,000 U.S. Open have been blessedly cool but there has been plenty of heat and controversy on the court as six of the 16 men's seeds and seven of the selected women have been eliminated.

Millionaire seems headed for sterling victory

By John Barre

WITH THE St. Leger, which will be attended by the Queen, now only six days away, nearly all the riding plans have been completed. Lester Piggott, whose name has at one time or another been linked with a high proportion of the runners, including the first and second favourites, Marquis de Sade and Camperdown, confirmed on Friday that he will be aboard the Henry Cecil-trained General Ironside, who has chances seem slim at best.

Businessman's Diary

U.K. TRADE FAIRS AND EXHIBITIONS

Date	Title	Venue
Current	MAR International Fashion Fair (cl. Sept. 8)	Nat. Exbn. Centre, Sharncliffe
Current	Int. Watch and Jewellery Trade Fair (cl. Sept. 9)	Royal Lancaster Hotel, W.1
Current	International Air Show (cl. Sept. 12)	Exbn. Centre, Harrogate
Sept. 7-10	Northern Floor Coverings Fair	Exbn. Centre, Harrogate
Sept. 7-10	BSI/Des. Council: "Living Standards"	Design Centre, S.W.1
Sept. 12-13	Menswear Fashion Fair	Belle Vue, Manchester
Sept. 14-15	Chelsea Antiques Fair	Old Town Hall, Aberdeen
Sept. 15-17	International Fisheries Exhibition	Harrogate Exbn. Centre, Harrogate
Sept. 18-19	Northern Antiques Dealers' Fair	Metropole Centre, Brighton
Sept. 19-20	Self-Serv. Display Equipment EXPOPEX	Harrogate Exbn. Centre, Harrogate
Sept. 19-22	Northern Packaging Exhibition	Grosvenor House, W.1
Sept. 20-22	Int. Broadcasting Convention	Bloomsbury Centre, W.1
Sept. 21-23	Electronic Instrument Exhibition	Wembley
Sept. 21-24	British Premiums Show	Nat. Exbn. Centre, Sharncliffe
Sept. 22-24	Int. Machine Tool Exhibition	Longleat
Sept. 22-24	Nat. Forest Machinery Demonstration	Metropole Centre, Brighton
Sept. 23-24	Commercial Motor Show	Exbn. Centre, Harrogate
Sept. 27-30	Autumn Floorcoverings Fair	Metropole Centre, Brighton
Sept. 27-30	Int. Plant Engineering and Maintenance Exhibition	Metropole Centre, Brighton
Sept. 28-29	EIA Engineering Exhibition	Metropole Centre, Brighton
Sept. 28-30	Electronic Instruments Exhibition	Bournemouth
Sept. 28-30	Milling Efficiency Exhibition	Edinburgh
Sept. 28-30	Subcontracting Industries Exhibition	Bloomsbury Centre, W.1
Oct. 4-7	World Offshore Exhibition	Nat. Exbn. Centre, Sharncliffe

OVERSEAS TRADE FAIRS AND EXHIBITIONS

Date	Title	Venue
Current	International Packaging Show (cl. Sept. 8)	Tokyo
Current	International Autumn Fair (cl. Sept. 12)	Leipzig
Current	Int. Non-Destructive Testing Exbn. (cl. Sept. 10)	Cannes
Sept. 8-12	International D-I-Y Trade Exhibition	Stuttgart
Sept. 9-12	International Autumn Fair	Vienna
Sept. 10-16	World Fair of Photography	Cologne
Sept. 10-18	Autumn Fair	Zagreb
Sept. 11-14	European Men's Wear Exhibition	Paris
Sept. 11-16	National Fair (Swiss Comptoir)	Ghent
Sept. 12-16	International Greeting Fair	Tel Aviv
Sept. 12-16	Agri. Machinery and Equip. Exbn.	Nantes
Sept. 13-17	Int. Electra and Mining Equip. Exbn.	Geneva
Sept. 13-17	Internat. Pharmaceutical Exhibition	Copenhagen
Sept. 13-17	Scandinavian Fashion Week	Florence
Sept. 13-17	Italian Furniture Fair	Milan
Sept. 13-17	German Industries Exhibition	Berlin
Sept. 21-24	Offshore North Sea Exhibition	Hamburg
Sept. 21-25	Int. Oil Pollution Exbn. and Conf.	Cannes
Sept. 22-29	Video '76	Paris
Sept. 22-29	SICOB Office Equipment Exbn.	Tokyo
Sept. 27-30	Ocean Development Exhibition	Tokyo
Oct. 5-8	Gastech LNG/LPG Technology Equip. Ex. and Conf.	New York

BUSINESS AND MANAGEMENT CONFERENCES

Date	Title	Venue
Sept. 7-9	Oyez: Tax Planning for Partnerships	Europa Hotel, W.1
Sept. 7-9	Urick: Man. of Finance in Construction Cos.	Management Centre, Slough
Sept. 8-10	EW Institute: Int. Countermeasures Conf.	London Hilton, W.1
Sept. 8-10	BSI/ISO: Int. Consumer Forum	20, Duchess News, W.1
Sept. 10-11	IPS: Procurement—the Years Ahead	York University
Sept. 12-14	W. D. Scott: Advanced Organisation and Methods	Swindon
Sept. 13-14	Assn. Cert. Accnts: Cash Flow and Liquidity	Barnington Hotel, W.C.1
Sept. 13-17	Internet (U.K.): Project Implementation and Man.	Nat. Exbn. Centre, Sharncliffe
Sept. 13-17	PERA: Int. Engineering	Melton Mowbray, Leics.
Sept. 13-17	Abraham: Systems—Developing Skills	68, Churchway, N.W.1
Sept. 13-17	Brunei University: Workplace Negotiations	Uxbridge, Middlesex
Sept. 13-17	Keppner-Tregoe: Decision-Making for Senior Man.	Bournemouth
Sept. 13-17	Computer Power: Basic Cobot IBM	Canterbury
Sept. 13-17	Marketing Imp.: Effective Selling	London Hilton, W.1
Sept. 14-16	Financial Times: Int. Leisure Markets to 1981	Uxbridge, Middlesex
Sept. 15-16	Henley Centre: U.K. Leisure Markets to 1981	Sheffield
Sept. 16	BIM: Legal Protection for Employers	Royal Lancaster Hotel, W.1
Sept. 20-24	P.E. Cons. Group: Self-Management	Carlton Tower, S.W.1
Sept. 20-24	Convention Informative (part of SICOB Exbn.)	Parquet Street, W.C.2
Sept. 21	Inst. Grocery Dist. Management Seminar	Training Centre, Egham
Sept. 21	BACIE annual conference	Paris
Sept. 21-23	Offshore Centre: Business Development	Nottingham University
Sept. 21-23	Legal Studies: Commercial Transactions	Aberdeen University
Sept. 27-29	G. K. Tutorial Services: Exchange Control	Royal Lancaster Hotel, W.1
Sept. 27-30	Env. Health Officers' Assn. Congress	Waldorf Hotel, W.C.2
Sept. 28	IBA: Exec. Remuneration and Fringe Benefits	Harrogate
Sept. 28-Oct. 1	Inst. of Petroleum annual conference	Royal Garden Hotel, W.8
Sept. 30-Oct. 1	Financial Times: The Banker. Investment House	Eastbourne
Sept. 30-Oct. 1	Assn. of the Philippines, Investors Chronicle and Malaysian Airlines System: Business in the Pacific Basin	Manila
Sept. 30-Oct. 2	MCE: International Cash Management	Oslo

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OVERSEAS NEWS

Spanish Opposition parties hold summit

BY ROGER MATTHEWS MADRID, Sept. 5.

THE SERIOUS political and economic difficulties facing Spain this autumn were emphasised at the weekend when a summit meeting of most of the country's main Opposition parties reiterated a series of demands all of which have so far proved unacceptable to the present Government.

The meeting, attended by nearly 100 delegates representing parties from the far Left to the Centre, regional organisations and workers groups, was held by some participants as the most important Opposition gathering since the end of the civil war.

After an all day debate in Madrid, hotel, the delegates agreed that it was important to speak with a single voice in its dealings with the regime. Its basic programme would be to demand a referendum on the present period which would have its essence full democratic liberties, freedom of trade unions, a total political amnesty without exclusions, and the recognition of the political right of Spain's different regions.

These aims would be pursued by intensified efforts to coordinate Opposition activity by the calling of massive peaceful demonstrations. A special committee is being set up to co-ordinate the various different parties.

The final communiqué described the aim of the summit as to bring about a change in the Government.

Soames, Stoel mission to reassure Ankara

BY DAVID CURRY BRUSSELS, Sept. 5.

THE DUTCH Foreign Minister, Max van der Stoep, and the Community's External Affairs Commissioner, Sir Christopher Soames, are going to Ankara tomorrow to clear the way for the negotiations towards a new agreement between the EEC and Turkey.

The mission is essentially to assure the Turkish Government that relations with Ankara command high priority in the EC but at the same time to urge Turkey to be realistic in its expectations of what the Community can offer to improve commercial and economic relations.

EEC-Turkish relations have been on the slide for some time. The decision to start negotiations on Greek membership of the EEC ranking bitterly in Ankara. On top of that Turkey's association agreement with the Community, which was a set-back in its time, has been made to look very ordinary by the recent accord reached by the Community with Mediterranean countries.

To reassure the Turks, the Community has offered to renegotiate the agreement to bring it more into line with the recent series of Mediterranean accords and to some extent to restore its unique status — a status derived from the fact that it foresees eventual Turkish entry to the EEC.

In March when Turkish discontent came to a head, EEC Foreign Ministers promised proposals to improve the agreement in time for a meeting in July. But it proved so difficult for the EEC States to reach agreement among themselves on their negotiating positions that the Turks were given only four days before the scheduled meeting to examine the EEC position. Faced with this take-it-or-leave-it situation, Turkey called off the meeting.

Since then the concessions have been improved but difficult to remain, particularly in the field of freedom of movement for Turkish workers into the EEC.

There are also difficulties over agricultural trade. The Nine are committed to improving access for Turkish products in the light of the regime recently agreed for the Mahabud States. The original Council proposal was rejected by the Turks as not worth having and have since been somewhat improved.

Greek economy 'better'

BY OUR OWN CORRESPONDENT ATHENS, Sept. 5.

ESTIMATING Greece's defecacy and the country's ability to integrate in the common market are the two main objectives of the Government's present economic policy, Minister Constantine Karamanlis said at the Salonica trade fair on the weekend.

He Premier said that despite a defence expenditure which tripled in the past two years, national stagnation and its social repercussions in Greece, Greek economy was doing better than in most Western countries.

Gross national income is expected to exceed five per cent in 1976 (compared with 3.3 per cent in 1975), mainly as a result of a 7.5 per cent increase in industrial production. And it is estimated that fixed capital investments at constant prices will increase by eight per cent, against 1.7 per cent in 1975.

Inflation will be contained at about 11 per cent, and the country's chronic balance of payments deficit will be kept at \$1.5bn (the same as last year).

However, Greece's disputes with neighbouring Turkey over the Aegean and Cyprus and the political and economic benefits to be reaped from full membership of the EEC necessitated sacrifices and the exercise of self-restraint, the Premier said.

With Soviets trim Czech oil

PRAGUE, Sept. 5.

TEST crude oil deliveries to Czechoslovakia in the next five years will fall short of original estimates, a senior official said.

Communist Party Secretary of Kempny, a member of the Presidium, said oil supplies represented "the most serious problem of Czechoslovakia's external relations in the field of fuel and power."

Kempny's speech at a five day rally, as reported by official Ceteke news agency, no hint of the extent of the oil cutbacks. Nor was any given for the decision to the original plans.

Last year, the Government decided it would buy 88m tonnes of oil from the Soviet Union over a five-year period, enough to 50 per cent of its requirements. Under a contract signed last December, 16m tonnes were due this year.

The statement was the first high-level indication that Moscow may be cutting back on oil exports to its East European allies. Although Soviet oil production has been increasing, some supplies have been diverted to Western countries.

Soviet leader Leonid Brezhnev returned to Moscow from a trip to the Soviet Republic of Kazakhstan today and conspicuously absent from his airport reception committee was it is understood, Premier Alexei Kosygin.

Mr. Kosygin's failure to appear both for Mr. Brezhnev's departure on Thursday and return strengthened reports that the 72-year-old Premier had suffered either a stroke or a heart attack.

Agencies

Peking row after quake

PEKING, September 5.

INSTERS, demons and the "society" surfaced in relief efforts after the Tangshan earthquake, the People's Daily newspaper said today.

The commentary, re-printed in the Red Flag Theoretical Journal, was the latest in a series of highly politicized articles illustrating the heroism, military and civilian rescue efforts, but suggesting a disarray broken out over how to handle the crisis after the quake.

The recent commentary said the who followed the line of purged and vilified former Premier Teng Hsiao-Ping caused "losses" in the

earthquake aftermath, but it did not specify what the losses were. The relief effort following the earthquake, which struck on July 28, was "by no means a simple struggle between people and nature but was closely connected with class and doctrinal struggle," the People's Daily said.

"The Revisionist line still exerts a poisonous influence among certain people, the bourgeoisie inside the party and a handful of class enemies who make trouble and carry out sabotage," it said.

"Monsters, demons and the dregs of society surfaced and the capitalist forces itched for action to launch attacks on Socialism," the paper said.

The paper said the

Nationalists in Dar talks

BY OUR OWN CORRESPONDENT DAR ES SALAAM, Sept. 5.

THE PRESIDENTS of Zambia, Mozambique, Tanzania, Botswana and Angola arrived here today for a summit to-morrow which could make or break U.S. Secretary of State Henry Kissinger's plans for a new diplomatic initiative in Southern Africa.

The Presidents began talks today with representatives of Namibian and Rhodesian nationalist movements but their formal summit will not start until to-morrow.

The meeting here is taking place at the same time as Dr. Kissinger's Zurich talks with Mr. Vorster. A senior aide of Dr. Kissinger is expected here on Tuesday to consult with President Nyerere on the results of both the summit here and the Zurich talks.

Dr. Kissinger is waiting for a recommendation from the Dar Es Salaam summit on whether he should try Middle East-style shuttle diplomacy in an attempt to solve the Namibian and Rhodesian issues.

The Presidents' meeting here had planned to hold a summit at about this time in any case, and

S. Africa strike threat

JOHANNESBURG, Sept. 5.

SO FAR, there is no evidence that the ANC is behind the latest strike attempt. The call is being made by word of mouth, according to Soweto residents, and the strike is supposed to last three weeks instead of three days.

Riot Police Chief, General David Kriel, said police had heard of such plans and would take special precautions. To-morrow is a public holiday. General Kriel said his men would act against strike organisers and anyone preventing people going to work.

It is two weeks since black youths in South Africa's biggest township Soweto, tried to enforce a three-day strike in protest against the Government's race policies. The strike call was first made by pamphlets which police said were the work of the banned African National Congress (ANC).

Justice Minister Mr. James Kruger, who denied allegations from Soweto leaders that his police deliberately instigated last month's Zulu backlash, is considering giving legal status to tribal vigilante groups in the townships, reliable sources said today.

VW may pay off losses

By Adrian Dicks BONN, Sept. 5.

VOLKSWAGEN, reporting strongly improved results for the first half of 1976, held out to shareholders this week-end the possibility that, if present demand conditions are maintained, it may be possible to pay off the company's DM683m (£134m) of carried forward losses.

The VW letter to shareholders did not put a figure on its financial results for the first six months of this year. But it left the impression that the DM124m profit achieved during the first three months was at least maintained.

The letter also avoided setting a date by which VW may now hope to pay off its heavy past losses. The new chairman, Herr Toni Schmuecker, has limited himself only to saying that it was hoped to contribute towards paying off the carried forward losses this year. But he has not mentioned the possibilities of paying them off entirely.

VW saw its turnover rise by 20 per cent to a new level of DM11.1bn, with booming domestic West German demand once again apparently the main contributor. Home turnover was up 29 per cent, and overseas turnover up 15 per cent, to a new level of DM7.7bn.

Herr Schmuecker also reported that VW had once again slightly increased its workforce.

Terrorism laws will curb Ireland's Press

BY OUR OWN CORRESPONDENT DUBLIN, Sept. 5.

IRISH newspapers will have their activities curbed and editors could face imprisonment under the Government's package of anti-terrorist laws now going through Parliament.

This has become clear from remarks made by two members of the Government in the last few days. They indicated that newspapers as well as individuals would be subject to Section 3 of the proposed Criminal Law Bill.

This would make it an offence, carrying up to 10 years imprisonment to incite or invite other persons to join an unlawful organisation or take part in support or assist its activities.

Suggestions that the Section would apply to the Press were first confirmed in an interview given to the Washington Post newspaper by the Minister for Posts and Telegraphs, Dr. Conor Cruise O'Brien. Dr. O'Brien said he had a file of letters to the editor published by the Irish Press, and while the new measure would hardly be used to jail the letter writers it might be used against papers which published these letters.

Dr. O'Brien is expected to make a statement on this subject during the continuing debate in the Dail this week.

In a radio interview today, the Parliamentary Secretary to the Prime Minister, Mr. John Kelly, said there was nothing secret or special about news-

papers, any more than any other section of society, and they could be affected by Section 3.

Newspapers were going to have to think a little more carefully than they had in the past about what they were going to print. Mr. Kelly said. He claimed the Government was dealing with a murderous organisation which had cost hundreds of lives.

These developments are already being seen as a threat to Press freedom in opposition and newspaper circles. The former Fianna Fail Minister for Justice, Mr. Charles Haughey, said they showed a Fascist and militaristic mentality among some members of the Government. Dr. O'Brien's remarks meant that they would have to look at this question again.

The editor of the Irish Press, the most Republican of Dublin's newspapers, Mr. Tim Pat Coogan, claimed Dr. O'Brien had compiled a dossier of letters to the editor in his paper and would be used to extend to the Press the same controls as apply to the Irish broadcasting service, RTE.

This is a reference to Section 31 of the Broadcasting Act which prohibits RTE from broadcasting anything which could promote the aims of violent organisations. It would seem that the effects of the proposed Section 3 on newspapers would be broadly similar.



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Building and Civil Engineering

Good start for George Wimpey

A £31m. contract awarded by the Tame Division of the Severn Trent Water Authority and another worth £1.8m. awarded by Nottingham Corporation, bringing the total to well over £3m., makes a good September start for George Wimpey.

The larger contract is a central services depot at Park Farm, Sutton Coldfield, West Midlands.

Included in the 9,625 square metres development is a workshop and stores building of 7,000 square metres at ground level and 630 square metres at first floor, constructed in steel frame with metal cladding. Other structures include a 215 square metres two-storey boiler house and incinerator, an 80 square metres single-storey substation and compressor building, a gate house and a two-storey office block/link section.

This contract, for which the architects are Peter Eling and Jones, is due for completion in June, 1978.

The Nottingham job, at Clifton Lane, is for 220 dwellings and is the second phase of the project now under way there.

The original contract was awarded to Wimpey in September last year and the two together will bring the total number of homes to 600.

Allows for curves in pipework

FLEXIBILITY of Victaulic mechanical pipe joints, made by the Victaulic Company (part of the British Steel Corporation's Tubes Division), of Hiteh, Herts, is the main reason for their selection for use on long runs of sprinkler feeder pipework required for installation around the big new crescent-shaped Transfesa International Freight terminal at Paddock Wood, Kent.

A bonded transit shed with its own freight link, the 300,000 square-foot Transfesa building is a quarter of a mile long and 220 feet wide, being built in a curve of 240 metres radius to provide maximum floor area in available acreage. A total of some 470 Victaulic joints, mainly of 4 inches diameter, were required in the sprinkler system designed and installed by Ellis Fire Protection of London.

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LABOUR NEWS

TUC membership lifted by women

BY ALAN PIKE, LABOUR STAFF

RECRUITMENT among women has been a major factor in taking membership of TUC affiliated unions to a record level of more than 11m. in the past year.

There are now more than 3m. women trade unionists for the first time and they are taking out membership at a significantly faster rate than men.

A rise of 872,802 in the TUC membership total since last year to 11,086,348 is partly accounted for by unions affiliating during the year. But about 250,000 of the new members result from direct recruitment.

The uncertain economic position, with widespread fears of redundancy, is clearly a reason for more workers seeking the protection of union membership.

Mr. Len Murray, TUC general secretary, said yesterday "significantly more than 50 per cent. of working people available for organisation were now in TUC unions."

Only three of the TUC's 18 trade groups—engineering, textiles and clothing—had shown drops in both male and female membership, presumably because of the impact of unemployment. The biggest increases, although largely explained by new affiliations and re-affiliations during the year, are in printing, public employees and civil servants.

At the annual pre-congress pensions rally yesterday Mr. Jack Jones, general secretary of the Transport and General Workers' Union, repeated demands for pensions of half gross average earnings for married couples and one-third for single old people with frequent reviews to keep pace with inflation.

Mr. Jones said that in about a year's time he would be an old age pensioner himself and pledged that he would continue the fight for better pensions then.

Two more unions join retirement campaign

BY OUR LABOUR STAFF

SUPPORT for a reduction in the retirement age to 60 has come from two more unions, the small but powerful Electrical Engineers' Association and the National Association of Schoolmasters.

This follows similar claims recently by shop stewards at Leyland cars, steelworkers and the National Union of Mineworkers.

The EEA's claim for early retirement has been one of its negotiating aims for the past two years. The Electricity Council has told the union no firm discussions can be held until all the complexities of the new Social Security Act are resolved.

Mr. John Lyons, EEA general secretary, said in the latest issue of his union's journal that reducing the retiring age to 60 was "far more important than reducing the working week to 35 hours."

According to Mr. Terry Casey, general secretary of the National Association of Schoolmasters, early retirement in the teaching profession would enable many of the estimated 20,000 unemployed young teachers to find posts.

'Slow road' for worker-sharing

BY RAY PERMAN, SCOTTISH CORRESPONDENT

A GRADUALIST, pragmatic approach towards industrial decision-making, rather than instant General Motors legislation, is recommended to the Bullock Committee on worker-sharing by the Scottish Trade Union Council (Development and Industry).

As well as reviewing progress in West Germany and Sweden, the council has made case studies of three Scottish companies which have experimented

'Cut private practice' from NHS

By David Churchill, Labour Staff

Health Service unions with a combined membership over 2.5m. are today launching a renewed campaign against private practice within the National Health Service.

With the TUC debating private medicine at Brighton tomorrow, the campaign is aimed at putting pressure on the Government to tighten the legislation still being considered by Parliament to phase out private practice within the NHS.

The five unions are jointly sending out over 250,000 copies of a leaflet explaining their case to the public, other unions, and MPs in an attempt to counter publicity by senior doctors, private hospitals and health insurance companies in favour of private practice.

The leaflet claims that private practice is subsidised by the taxpayer and that private patients jump the queue for admission to hospitals, so lengthening waiting lists for NHS patients.

And it suggests that nurses and ancillary staff are expected to spend more time dealing with the demands of private patients, who are not necessarily those in greatest need of attention.

Many part-time consultants, it says, concentrate on private patients and so junior doctors have to work longer hours to deal with the Health Service patients. As a result, many junior doctors are given inadequate training and supervision.

The Council of the Royal College of Nursing has voted unanimously to seek certification under the Employment Protection Act as an independent trade union to put the College on an equal footing with other NHS staff associations.

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HOME NEWS

NEWS ANALYSIS—ELECTRIC MOTORS

The choice is: profit or patriotism

BY CHRISTOPHER LORENZ

SOME of the most crucial questions for Britain's industrial future are epitomised by the National Economic Development Office working party report on electric motors and control gear, which has just become available after months of secrecy.

The delay in publication is understandable for the report represents an extremely awkward compromise between the view of those—especially on the Government and union side—who consider much more should be done to expand production and exports, and the manufacturers' view that further dramatic increases could be achieved only at the expense of profitability.

The state of the electric motor industry is of national importance on several levels. There are widespread fears among the NEDO working parties that electric motors will again be in short supply in the next boom; they were recognised as a "bottleneck" for a wide range of British industry in 1973-4.

More fundamentally, the state of the industry (and especially its trade position) raises the thorny question of whether any company should be almost exclusively concerned with maximising profitability, or whether profit targets should be moderated for the sake of the nation's overall interests—in this case, its balance of trade.

Simplifying to its extreme the dilemma posed by the NEDO report—both overtly and by implication—the picture is as follows: the manufacturers are still under pressure from all sides to lay down more plant (with or without Government support), so as to ensure that they do not again fail to provide their many customers with all the motors they need, with the result that imports are sucked in and exports diverted to the home market.

The manufacturers argue in reply that they have expanded capacity considerably since the "bottleneck" of 1973—which, they claim, stemmed from shortages of materials and components rather than insufficient capacity in their own plants—and that further projects are now

going forward, some with assistance from the Government's accelerated investment scheme. The industry says there is now enough capacity "to meet the true rate of usage in industry during the next peak," to quote the report—though only three paragraphs later it raises doubt over whether this will remain true.

What the report does not spell out is that imports are proving more resilient than had been expected. After the surge in imports of 737,374, when the trade surplus in so-called "standard" a.c. motors, and those of medium size (up to 500 hp) shrank to £2m, the situation took a decided turn for the better last year, as had been expected with the onset of economic recession: the trade surplus recovered to almost £10m.

But instead of continuing to improve it worsened sharply in the first six months of the year, to £2.5m, compared with £1.7m between January-June 1975. This reflects a fall of only £700,000 in imports but a drop of £2.7m in exports.

Should this continue the sector would end the year with a surplus of only about £5m—less than half those of 1975 and 1972. Some sources expect this to be the outcome.

Within the industry, however, there is some optimism that import pressure will ease as supply contracts expire and as several of the major continental companies raise their prices to an "economic" level.

This appears to be the crux of the matter. Several years ago a number of the major continental manufacturers, especially Leroy-Somer of France, increased their capacity in dramatic fashion—just as the British are now being encouraged to do.

The Continentals have since faced an onslaught of East European imports, plus a drastic recession in demand—in what has always been a most steeply cyclical business. The entire West European industry is now working at half capacity, so many of the smaller motorists, being sold at uneconomic prices, it is in motors of between 1 and 10hp that imports to the

U.K. have maintained their hold so far this year. Above that range, and especially above 100hp, they are falling back. Equally, it is in the small sizes that British exports have taken the hardest knock.

Rather than indicating that U.K. industry is uncompetitive in the smaller motors, its export times point to a statement in a U.K. report that "U.K. motor prices are among the lowest of the West European manufacturers." The apparent resilience of imports to the U.K. is due, they argue, to a "Continental" excessive expansion of capacity in the past, the readiness to sell small motors, well below list prices and on the financial burden on unproductive.

Were the U.K. industry dominated by less profit-conscious companies than GEC or Hawker-Siddeley, the picture might be different. Both are obviously prepared to sacrifice market shares unprofitably in limited periods, but neither as this as the long-term road to survival.

Thames rents week on New York TV

BY ARTHUR SANDLES

NEW YORK, Sept. 5.

THAMES TELEVISION takes over the evening running of Channel 9 television in New York tomorrow. The exercise, costing nearly \$1m, gross but only \$100,000 net, lasts one week.

Thames has rented the time from WOR-TV, one of the New York minor TV "leaguers," at a price probably not much less than £200,000. "If the pound had not fallen since we signed (it was at \$2.04 then), we might have broken even," the company said.

Thames direct income will be drawn from advertising. It is sticking as far as possible to British standards, thus limiting the time for advertisements to 9 minutes an hour, rather than the U.S. top level of nearer 15 minutes.

In a programme schedule entirely British in origin, a great many British companies have bought time, including the roads, the Lake Airways, the Savoy Hotel, THF, Airways, British Rail, and the British Tourist Authority; so have Volkswagen and Air India.

Thames begins this week with a documentary about itself and the River Thames, then launches into a selection of its own shows. The hope is that U.S. companies will spot a few tempting items and buy them.

Against the Monday night ratings winner, Rhoda, Thames will offer the Benny Hill Show. Later in the week, the Police Women, at present doing very well in the U.S. charts, will have to match her strength against the British programme Special Branch.

'Soon No. 1 film-maker'

LORD GRADE'S Associated Television Corporation has caused something of a stir here, because of a promise by its film-making subsidiary, ITC, that it will soon be the world's biggest operator in the film business.

In a country that already has such groups as Fox, MGM, United Artists and Disney, the claim by a foreign organisation might normally provoke amusement. But ITC is backing it with a formidable list of productions.

Lord Grade, sticking to his former title Sir Lew Grade, is taking advertising space in trade papers to say: "We're making the words 'major motion picture' mean something again."

Mr. Abe Mandell, head of ITC Entertainment, is quoted in money.

It is suggested that \$23m. (around £14m.) has already been spent recently on making pictures, and a further \$100m. is planned. Filmed television material would account for a further \$80m., but not all of this would be ITC money. The film business is usually a complex assembly of guarantees, part-finances and pre-sales.

Lord Grade has made it clear he is convinced that the big-budget family (in a very broad sense) picture with international appeal is what is going to make

Slower rate of growth in lending 'indicated'

By Michael Blandon

A SLOWER rate of growth in bank lending could be indicated by new figures due out this week. This comes after a period of higher rates in recent months.

Increase in lending shown by the banks has contrasted with recent evidence of relatively slow economic recovery. Higher demand for loans has appeared to reflect the need for finance for higher stocks of imported materials and increases in working capital needs, partly imposed by higher materials costs.

The large increase in loans in the month to mid-July, announced last month, caused the highest jump in the broadly-defined money supply for more than a year. If the rate of growth in lending is sustained it will arouse concern in the C.I.Y. over the potential impact on the money supply and the possibility that interest rates will have to rise.

Exaggeration

It was widely felt that the July figures, when the London clearing banks showed an underlying rise of about £350m. in their sterling lending to the private sector, exaggerated the basic trend. The mid-August figures for the clearing banks, due on Wednesday, will be examined closely for evidence of the level of banking activity.

The progress of the monetary situation will be illustrated on Thursday by the publication of Government financial transactions for August, including the borrowing requirement.

Dell starts trade talks in Greece

ATHENS, Sept. 5.

EXPANSION of Anglo-Greek trade and British interests in projects in Greece will be discussed by Mr. Edmund Dell, the Trade Secretary and Greek cabinet minister.

Mr. Dell started a three-day official visit to Greece today. He will talk with almost all of Greece's economic and trade ministers, including Mr. Panayiotis Papadimitriou, the Minister of co-ordination and planning, who is the country's economic overlord. He will also meet Mr. Evangelos Averoff-Tossitis, the Minister of Defence and Mr. Demetrios Bisiotis, Minister of Foreign Affairs.

Mr. Dell is expected to outline British interest in participating in the planned new Athens International Airport, the Athens underground railway, the electrification of the Greek State Railways, offshore oil and natural gas installations, re-organisation of the postal system and social services, computerisation of government agencies and enter-Greece, prices, and modernisation and

completion of Athens and S. unica sewerage systems. British experience in offshore installations and underground railway projects such as the Victoria Line in London is considered a trump card in Mr. Dell's hand.

The talks will touch on eventual co-operation of British and Greek shipping interests, working out a joint European shipping policy, with a view to countering the trend in certain countries to restrict the transport requirements to the use of their own flags.

Questions related to Greece entry in the EEC are likely to be discussed. British experience gained from the special arrangements of the transitional period of membership should prove helpful in Greece.

Mr. Dell will also meet prominent members of the country business world and visit installations of a bauxite mining company near Dolphi, central Greece.

APPOINTMENTS

Non-executive post at Mather & Platt

Mr. S. R. Harding has been appointed a non-executive director of MATHER & PLATT.

Mr. Alan E. Thomas, a non-executive director of JOHN WILLIAMS HOLDINGS, has become an executive director with responsibility for the marketing of the group. He continues his association with Strutt and Parker as a consultant.

Mr. G. Rogers has been appointed to the Board of the BRITISH NURSING ASSOCIATION as administrative director. Mr. Rogers was previously executive director, management services, York. He succeeds Mr. E. (Kirkby) factory manager, who has retired.

Mr. Maurice E. Leach has been appointed chief signal and telecommunications engineer for the BRITISH RAIL Eastern Region based at regional headquarters in York. He succeeds Mr. E. (Kirkby) factory manager, who has retired.

Mr. Jim Fallon has been appointed to the newly-created post of director of external relations. He was formerly director-sales.

Thomson Regional Newspapers has appointed Mr. Ernest R. Patrice as managing director of LANCA-SHIRE & CHESHIRE COUNTY NEWSPAPERS.

The Board of BICC CONNOLLYS, formed by an amalgamation of the winding wires division of BICC and the winding

Mr. W. R. Albery, recently managing director of the Westminster Property Group, has left the U.K. to take up a new position in Hong Kong, as managing director of SHUI & CHOW INTERNATIONAL, a subsidiary of Hutchison International. He will become managing director, U.K. place of Mr. D. C. Nixon, who retires in December. Mr. Albery will also be advising the parent company on its property affairs.

BUSINESS OPPORTUNITIES

READERS ARE RECOMMENDED TO TAKE APPROPRIATE PROFESSIONAL ADVICE BEFORE ENTERING INTO ANY COMMITMENTS.

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NATIONAL MANAGEMENT GAME

1977

Sponsored by the Financial Times, International Computers Ltd. and the Institute of Chartered Accountants in England and Wales in association with the Institute of Directors and the Confederation of British Industry.



Entry lists are now open for teams wishing to compete in the 1977 National Management Game—the annual championship that provides invaluable management training by simulating a boardroom environment in which team members work together to thrash out managerial issues—within a time limit, and under the pressure of competition.

The problems and risks relating to realistic business situations and the consequences of the strategies adopted are posed and appraised by computer. And each team is, in effect, a company making decisions on the deployment of its financial, marketing and manufacturing resources. The winning team is the one whose final balance sheet shows the greatest net profit.

Round 1 begins on December 29 1976 and the finals take place in London in July 1977. Entry fee per team: £50, including VAT. Closing date for entries: November 12 1976.

NATIONAL MANAGEMENT GAME 1977
Request for entry form

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I enclose the entry fee of £50, incl. VAT.

Kindly tick boxes as appropriate

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Individual awards are made to all finalists.

The Executive's and Office World

Businessmen are major users of Concorde. Michael Donne and Nicholas Leslie look at how they and their companies rate its value in terms of prestige and speed.

Balancing a supersonic cost

CONCORDE HAS now been in service on the London-Bahrain route since January 21, and on the London-Washington route since May 24. Although utilisation is still very low, this is sufficient time for British Airways to be convinced that the aircraft can justify its existence by making money on direct operating account although not yet yielding profits on the total investment of \$155m. Involved in buying five aircraft, so far only two have been delivered and BA has spent over \$75m.

The load factors (the number of seats sold) on the North Atlantic run are excellent. From Washington to London, the average load factor is 90.2 per cent, but westbound to Washington it is 93.2 per cent. On the route eastbound to Bahrain, the load factor is only 34.8 per cent, but is much better at 63.6 per cent westbound to London. By early August BA had carried 3,791 passengers on the Bahrain run, and 2,292 on the Washington route.

Some preliminary market research carried out by BA indicates that most of these passengers are businessmen, with a wide mix of nationalities, but perhaps a preponderance towards Americans, on the Washington route and Arabs on the Bahrain run. Some facts, however, are significant. On the Bahrain route, about 20 per cent of the passengers come from Australasia, this indicating that people want to fly subsonically as far as Bahrain, and then finish their journey supersonically. Abu Dhabi appears to be the most popular onward destination from Bahrain, however, while Doha also figures strongly in the list.

On the Washington route, New York is still the biggest single originating centre for traffic, accounting for some 17.4 per cent. But overall, on the North Atlantic run some 90 per cent of the total Concorde traffic in both directions is making connecting flights at one or other end, while some 30 per cent connect at both ends and use the Concorde sector as a speedy middle link in the journey chain.

One odd fact is that 28 per cent of BA's Washington to London passengers go on to Paris, notwithstanding the existence of Air France's own direct, Washington-Paris Concorde service.

Three reasons

The BA studies have not yet gone as far as identifying each of the passengers sufficiently to categorise them by occupation, home-town, reason for travel and so on. But enough information has been obtained to indicate that most of Concorde's customers travel for one or more of three main reasons. First, because Concorde is something new: it is there, and is a prestige aircraft in which to fly. Second, because it gets the passenger to his destination much more rapidly—in 3 hours 50 minutes as against seven to eight hours in a subsonic Jumbo jet on the Atlantic—so that he feels fitter and fresher. Third, so far as U.S.



Travellers check in at the Heathrow Concorde desk.

passengers are concerned, the exchange rate is in the dollar's favour, so that the ride, at least westbound to the U.S., is one of the biggest travel bargains on the North Atlantic. Companies in London asked by The Financial Times about their policies on Concorde flying show, however, that few major U.K. companies seem to use Concorde regularly or to operate a policy about when to use it, and when. The most common factor seems to be that travel on Concorde would have to be justified in economic terms while the prestige factor is accorded a very low priority.

Company policy

Barclays Bank International says that any personnel flying Concorde—and none have yet—would have to justify the trip in terms of the importance of the business in hand, and savings in executive time and finance. The Beecham Group similarly has no specific policy, although any use of Concorde would be likely to be limited to very senior directors or executives.

Other companies with similar views include Grand Metropolitan, Royal Insurance Group and EMI, and most agree with the views put forward by Barclays. Many companies, including BOC International, Plessey and Richard Costain, make the point that economic justification is important, indicating that, but of the U.K., at any rate, the 20 per cent surcharge is of considerable significance. BOC says its directors may fly Concorde as a normal part of first class travel while at Plessey the urgency of the job involved would be the main criteria. Each of the three main factors identified by British Airways is worth analysing in turn. First, prestige: Concorde is a big talking point among the U.S. business cocktail and lunch circuit. To be able to say one has flown Concorde is something which, like reading the National Geographic, identifies you.

This is perhaps the least significant factor of the lot, and BA does not expect the novelty value to last for long. While it is a good advertising point it is not believed to generate substantial business on its own account. Secondly, the Concorde's Atlantic schedules are so

designed as to make it as easy as possible for a businessman to arrive in Washington (at 12.05 on Thursdays and Saturdays) and to leave (at 12.30 on Fridays and Sundays) in time for connecting flights. So far as arriving in London is concerned, at 21.35, the passenger from Washington gets one of the shortest possible days, and can get to bed at a reasonable hour, whether he is planning to work or travel on the next day. It is this ease of connection to other destinations that probably accounts for the bulk of the high load factors on the BA Washington route.

Although there has been some criticism that one of the flights arrives in Washington on a Saturday lunchtime, and one in London on a Friday night, it does not appear from the load factors (and the heavy forward bookings) to be a disadvantage from a businessman's point of view, while from this autumn another frequency will be added—outwards to Washington on Tuesdays, and inbound to London on Wednesdays.

Fatigue

BA makes a particular point of stressing the ease of making connections, especially since it helps to cut down the total travelling time. It must play a part in combating fatigue. "Jet Lag" or "Time Zone Fatigue" is a subjective phenomenon. Everybody suffers from it, but some much more than others. It is an arguable point whether crossing time zones faster enhances fatigue because the body's rhythms are required to readjust that much more quickly. But having travelled on Concorde several times I know that one does arrive at one's destination fresher and fitter than on a subsonic Jumbo, and for that reason I prefer to travel Concorde.

The third factor—fares—throws up an intriguing situation in that it is possible at present to fly Concorde from London to Washington at less cost than for a first-class subsonic Jumbo ride from Washington to London, notwithstanding the surcharge on Concorde of 20 per cent of the normal first-class fare.

This anomaly stems from the current depreciation of sterling against the dollar, and from the fact that the airlines' machinery for meeting these problems through a system of currency

surcharges moves so slowly that it has not yet caught up with the situation. The subsonic first-class Jumbo ride from Washington to London costs \$662. The comparable fare out of London to Washington is \$291, which at current exchange rates is \$519. By buying two single tickets, therefore, one in the U.S. and one in the U.K., paying in local currency, a traveller can get the round trip for \$1,181 instead of the normal \$1,324, a saving of \$143. Similarly, by buying a single Concorde ticket to Washington from London, at \$332, or \$627, a traveller can in fact fly back subsonically for less than he paid to fly over on a Jumbo. Astute Atlantic travellers have recognised this, and although BA does not admit it, it may account for part of the very

good load factors from London to Washington on Concorde.

But a survey of actual and potential Concorde travellers still appears to indicate that it is New York that will be the most important market for their aeroplane on the North Atlantic run for a variety of reasons. The first, inevitably, is that New York is the business capital of the U.S. and generates more North Atlantic traffic than any other U.S. centre. It has more connecting flights with other parts of the U.S. than Washington, so its passenger catchment area is larger. Moreover, most of those flights go direct to and from Kennedy Airport, whereas in Washington many connections start or end at National Airport.

From the British viewpoint, however, many of these factors do not seem to apply.

This does not necessarily indicate that U.K. companies are among the backwoodsmen so far as promoting the use of advanced technology is concerned. In fact, many of them are in the advanced technology business themselves. More to the point, it indicates that so far the Concorde network is too restricted to be of any major benefit. But when it has been considerably expanded—say to New York and other U.S. cities, and to Singapore and Melbourne and perhaps also to Hong Kong and Tokyo, a totally new situation will emerge. Even so, however, enough information is emerging to indicate that Concorde is beginning to make its way in the air transport world.

EXECUTIVE HEALTH

Pills and jabs

BY DR. DAVID CARRICK

ALTHOUGH financial stringencies have reduced the number who can holiday abroad, some people are still able to afford the luxury of language difficulties and alien habits. Business executives especially seem to be able to travel all over the world so long as such peregrinations promise profits.

The latter group, in my experience, is far less meticulous when it comes to rules concerning health before, during and after foreign forays than the holidaymakers. This is probably because wives, who rarely accompany their men on business but usually do on holiday, are far more conscientious and meticulous where health is concerned than are their consorts, so that immunisations (when needed) are requested in ample time.

Many businessmen, either through their own thoughtlessness, or that of their seniors, who make snap decisions to send employees off at short notice, forget important health precautions. This is as foolish as it is dangerous, and it is important to remind would-be travellers of necessary precautions.

Immunisations fall into two categories: the mandatory and the desirable. Of the former, vaccination against smallpox is still required for many countries, the U.S. in particular, and has to be repeated every three years. Cholera immunisation is infrequently required although the pandemic still exists, and during the stay and for four weeks after returning home, these injections have to be repeated every six months. Any pill-hater who believes he can outwit mosquitoes is a fool required for much of South



"Sorry Hays... just nip over to Hawaii with this contract."

America and central Africa. It lasts ten years. It should be remembered that a lapse of at least seven days must be allowed between immunisations against yellow fever and smallpox. Visitors to the Mediterranean coastal areas are well advised to be immunised against typhoid. Poliomyelitis, although rare these days, can reappear at any time and everybody should be protected by the nicest medicine ever—three drops of vaccine on a sugar lump—to avoid a life-time of crippling.

Immunisation against tetanus is a wise precaution as the wretched causal organism can be found almost anywhere and is a potent slayer. Much more localised, but very unpleasant and sometimes fatal, are several varieties of malaria. Anti-malarial tablets have to be taken two weeks prior to going to danger areas and continued, during the stay and for four weeks after returning home, by any of these, unless he is extremely unlucky or very foolhardy.

MOVING JOBS

BY SUE CAMERON

The family life of 'gypsies'

MANAGERS AND their wives are not properly consulted by companies over moves to new jobs in different parts of the country according to a study of "executive gypsies" carried out by the Institute of Science and Technology at Manchester University. The study, written by Judi Marshall and Cary Cooper, appears in the latest edition of Management Decision. It shows that many companies move their executives without considering the disruptive effect on family life without taking wives' views into account, and without being honest about promotion prospects.

Interviews with 40 managers and their wives indicated that the stresses and strains of moving are far greater at certain points in an executive's career than at others. The study says that when a company is planning to move a man it should consider "individual and family circumstances—house moves, schooling, wife's career plans—with a view to integrating them into the changes and demands of work." Wives should also be consulted.

Conflict

"At the moment organisations are contracting with one element of the family unit but making decisions which radically affect the unit as a whole. By operating this way they often cause conflict between a manager and his family." The authors also insist that executives should be given plenty of notice about moves to new areas and in addition to this

they should have the right to take time off to find a house. Arrangements should be made for wives to meet other company wives in their new towns and families should be provided with as much information as possible about their destination.

In addition to this managers should be given honest and up to date information about their career prospects so they can work out all the consequences of a suggested move.

The worst possible time for a man to take up promotion in a new area was found to be when he is married with young, school age children. At this stage of development wives are tied down with family responsibilities and find it harder to make new friends and house buying becomes more difficult because of the need to be near a good school.

Some managers who took part in the study had tried to solve these problems by leaving their families in their old homes while they themselves commuted back and forth at week-ends. But this often had serious consequences for the children and sometimes put an intolerable strain on the marriage.

Young children often started worrying that their fathers would desert them altogether. And the men became tired of having to travel long distances while settling into a new job and house hunting. The study showed that one of the biggest complaints of executives who had to move around in their jobs was the lack of information they were given. Often managers were told they

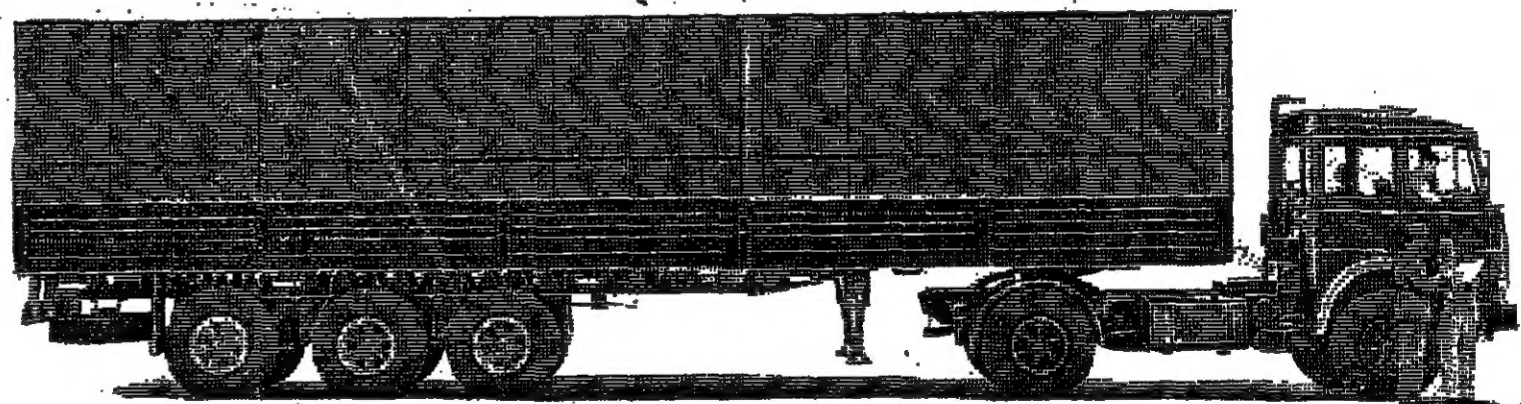
would be staying in a certain place for a number of years and their companies then decided to move them again in a very short space of time. Many organisations also failed to tell people of the effect a move might have on their chances of future promotion.

Reluctance

It was found that some men had moved—with great reluctance—because "they believed this was the only way to further their careers. They then found themselves stuck on the promotion ladder and in addition they were living in a town they disliked. Others who had turned down a move found there were no adverse effects on their careers although one manager who took part in the study said his career "went downhill" when he refused to move even though he had been assured this would not happen.

Younger wives resented being treated as "chattels" and many of those interviewed felt that their companies did not consider their feelings enough. "Examples of such moves being arranged when the wife is pregnant, wives having to move their families abroad without the husband's help and not having adequate opportunities to see the new location beforehand were quoted."

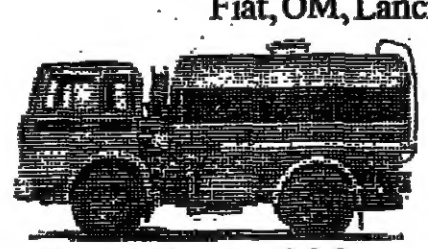
The Mobile Manager and His Wife. By Judi Marshall and Cary L. Cooper. Management Decision, Volume 4, Number 4, 200 Keighley Road, Bradford, West Yorkshire BD9 4JZ. £5.70p.



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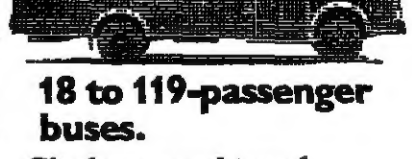
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MONDAY, SEPTEMBER 6, 1976

How costs get pushed up

THE SHORT-TERM forecasting of inflation is now a flourishing art—a fairly straightforward matter of deriving forecasts of future prices from current movements in wages, material prices and other costs: but such exercises have little or no explanatory power.

The monetary thesis is so fashionable that it is astonishing that no proper model appears to have been devised to test it against British experience: but in any case its most fashionable version, as put forward by Sir Keith Joseph, seems to suggest that monetary excess is the result of the failure of successive governments to resist trade union excess, and to allow over-ambitious wage claims to reap their natural reward in terms of rising unemployment. If this is the truth, then wage push is the prime cause: but the tremendous acceleration of wage claims in recent years—and not only in this country—would remain to be explained.

Traumatic events

One must be grateful, then, for the efforts of three economists who reported last week, in the Review of the National Institute of Economic and Social Research, the result of their efforts to test the main ruling theories against up-to-date experience, including the traumatic events of 1974. While their review can hardly be described as a comprehensive survey, since only four basic theories were tested in a fairly simple form, their results are highly suggestive.

First, they claim that the so-called Phillips curve relationship, which suggests that the main cause of inflation—or at any rate of wage increases—is excessive demand for labour, so that a high level of unemployment will check it, is not supported by British experience at any period since the war. In recent years, it seems to have been turned upside down, so that at times of rising unemployment (and correspondingly slow progress in output, earnings and productivity) wage and price increases tend if anything to accelerate.

However, the theory that growing trade union militancy or monopoly is responsible for the worsening trend—a theory which would associate acceleration

On the way

This is the truth which seems at length to have dawned on Mr. Healey, who has been warning his supporters that the public will no longer pay for larger spending programmes. If he can progress further, and convince Labour that the best way in which it can serve the interests of its supporters is to make it possible to reduce taxes on wages, we will at last be on the road to conquering inflation.

On the road to conquering inflation.

Getting back in step in Ireland

IF THE terrorists who plague Ireland, both North and South, are ever to be defeated, then a first requisite is that the British and Irish governments must work together. Over the past few years a closer understanding of the need for co-operation at this level has been developed, but last week the evolving harmony was rudely disturbed when the European Commission on Human Rights published a report that partly upheld the Irish Government's complaints that torture or "inhuman treatment" was inflicted on some prisoners in Northern Ireland five years ago.

Old charge

The irritation of the British side at this resurrection of what is now an old charge was not hidden by Whitehall: as a result there has been a distinct cooling of relations between London and Dublin. The charge may not be lasting, but in Ireland such setbacks cannot easily be afforded, even if they are temporary. This is particularly so when possibly more fundamental differences of approach of the British and Irish governments are beginning to become apparent. Ironically, these differences seem to place the Dublin Government nearer to a hard line on terrorism, with Britain adopting the more cautious approach.

The Irish Government's new anti-IRA legislation, introduced at a time when peace rallies in Dublin and elsewhere have demonstrated the growing public antipathy towards terrorism, increase the legal weaponry available for use by a "law and order" administration. This demand that part of that re-appraisal of the British national state of emergency, approach: this is of greater importance than the personality of the new Minister. Most importantly of all, if the new approach is to be a decision to carry on as always this is likely to be a tricky matter of not upsetting the sensibilities of what can be a hick electorate.

U.K. approach

This must be an unknown, and it does not seem likely that it will be tested while Mr. Healey himself appears to be in waiting for a new post in the forthcoming Cabinet reshuffle. Yet the interests of Northern Ireland demand that part of that re-appraisal of the British national state of emergency, approach: this is of greater importance than the personality of the new Minister. Most importantly of all, if the new approach is to be a decision to carry on as always this is likely to be a tricky matter of not upsetting the sensibilities of what can be a hick electorate.

Direct investment in the U.S. from overseas has boomed in the last three years. Stewart Fleming reports

The investment tide flows back

THE tide of foreign indirect investment from the U.S. which swept around the world in the 1950s and 1960s is abating. It is being replaced by a surge of foreign investment by overseas corporations into the U.S.

Last year, according to Commerce Department statistics, direct foreign investment by the U.S. rose only 12.1 per cent. to around \$133bn. and a study this year by the economics department of McGraw-Hill Publications suggests that growth this year will only be moderate too.

In contrast, foreign direct investment in the U.S. suddenly accelerated in the past three years. In the decade up to 1973, growth of foreign direct investment in the U.S. averaged around 6 per cent. a year. Since then it has been averaging nearer 20 per cent., and even in 1975, when most observers detected a slowdown probably reflecting the impact of the recession abroad, foreign investment still grew by just under 20 per cent., about \$4.3bn.

Most observers believe that this rate of growth is continuing, if not accelerating this year, although it will be some time before the most authoritative figures will be available.

It is not necessary to rely entirely on subjective assessments of what may now be happening. The U.S. Conference Board, an influential research organisation with strong ties with business, recently reported that in the first half of this year, in dollar terms, announcements of foreign direct investment plans in the U.S. are running 60 per cent. ahead of last year at some \$900m.

This figure excludes the estimated \$250m. which Volkswagen of West Germany is planning to invest over the next couple of years in its first U.S. manufacturing plant to build the Rabbit (known in Europe as the Golf). This decision is in itself a significant pointer as an example of a company with a strong export base in the U.S. (through the Beetle, whose sales have been declining) deciding on the creation of a manufacturing plant.

The conviction that increasing foreign investment in the U.S. is not a transitory development is already leading some banking organisations to prepare for what they hope will be a profitable new line of business.

In the 1950s and 1960s many of the biggest U.S. commercial banks such as Citibank were opening foreign branches to service the U.S. corporations overseas. Now it seems that branches are being used to facilitate the reverse movement.

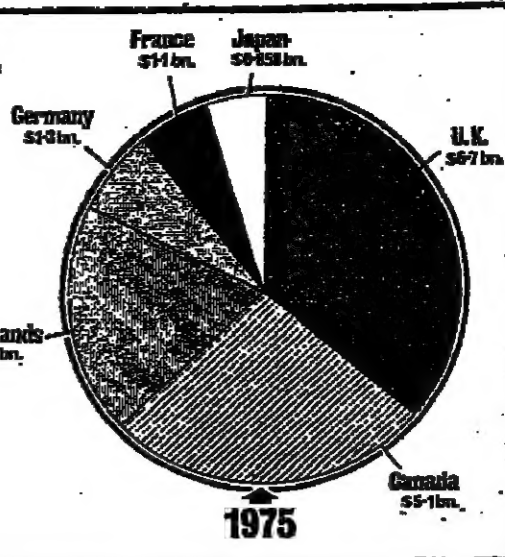
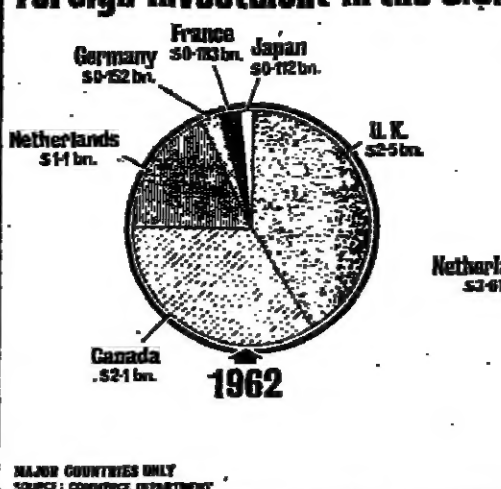
Citibank has recently set up what it calls its international marketing unit under a vice-president, Mr. John Rose, which is seeking out European companies which are looking to expand in the U.S. perhaps through acquisition.

The investment banks too are actively canvassing in Europe for customers who want a U.S. base, and in the U.S. they are seeking out acquisition targets. As one banker pointed out, the Securities and Exchange Commission disclosure requirements, because they are so demanding, are a great help to foreign companies looking for a U.S. acquisition.

Mr. Rose, of Citibank, makes the point that by and large the new market opening up is not only among the biggest multinational corporations outside the U.S. In many cases these already have either well-established operations here or commercial and financial ties. Companies such as the Shell Group, British American Tobacco, Brown and Wilkinson Industries, Nestlé, British Petroleum and Hoffman-La Roche have well established U.S. corporations, in some cases ranking high up the Fortune list of 500 largest industrial corporations.

Rather the target is the overseas company with perhaps sales in the \$250m. to \$500m. range for which expansion in the U.S. might be its first excursion into multinational business.

Foreign investment in the U.S.



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Proportion of earnings

The above diagrams give a breakdown of foreign direct investment in the U.S. for some main categories, but the overall figures are just as indicative of the trend.

Thus in 1962 Commerce Department statistics indicate that total foreign direct investment in the U.S. was \$7.6bn. The figures are based on the nominal value of equity investment plus net loans and re-invested income and include companies with a 25 per cent. or over foreign shareholding.

By 1972 it had increased to nearer \$15bn. A substantial proportion of this increase, perhaps as much as a third, came from retained earnings.

By the end of 1975, the figure had come close to doubling again reaching \$27bn., and total assets of these companies (a large proportion in insurance and banking) was around \$174bn. at the end of 1974. Analysts believe that if any-

thing the Commerce Department statistics are conservative. The Department itself is currently revising them to include shareholders of 10 per cent. and over which will give the total a further boost.

So far this year there has been plenty of evidence of the growing interest in the U.S. from European companies in particular. Hawker Siddeley, the British aviation group, has bought a 30 per cent. stake in Onan Corporation for \$37m. When Babcock and Wilcox found itself with \$70m. to spare from the sale of its German interests to the Shah of Persia, and all the world to choose from, it decided to buy the American Chain and Cable. Imperial Chemical Industries, too, has set a policy of rapid expansion in the U.S. Rather like Babcock it felt it was underrepresented in the U.S. in relation to its size (and its European competitors like Hoechst and BASF which are well established here). Thus it has interests in offshore exploration consortia in the Gulf of Mexico, has a 15 per cent. stake in a Chevron-led consortium which has just won five licences in the Atlantic lease sale and is expected shortly to announce important new plant programmes in the south of the U.S.

Only this month St Gobain-Pont-a-Mousson, the French concern has said it intends to spend in the region of \$22m. to buy the 10 per cent. of Certain-Teed, the Midwest building products group, which would give it over 50 per cent. of the equity. Recently, too, the French state oil company Elf-Aquitaine tried and failed to get control of a U.S. chemical company, Ventron. It lost out to a rival U.S. bidder, Thiokol, brought in by Ventron as a defensive manoeuvre. Landis and Gyr, the Swiss electrical engineers, have announced an offer through White Weld for Duncan Electric, the fourth largest U.S. electric meter producer. Again, a rival U.S. bid from Midland-Ross Industries could be just around the corner.

GEC, one of Britain's largest industrial groups, expects to finalise an agreement to buy

from White Motor Corporation a subsidiary company which manufactures diesel engines for industrial use. This will give GEC its first manufacturing base in the U.S.

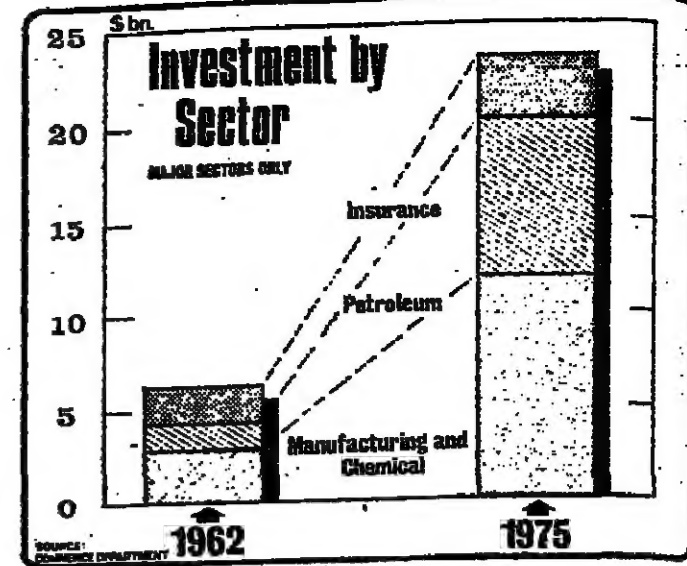
These are some of the main examples which can be easily picked up from announcements because they involve public companies. But most investment bankers on Wall Street agree that the wave of immigrant corporations is much stronger than these few examples would indicate, especially among smaller family concerns which deliberately shun publicity and in some cases are keeping their investments below a publically reportable level.

It is one thing to describe what is happening, but another to explain it, and in particular to explain the acceleration in recent years in the growth of foreign investment.

The most comprehensive analysis of the subject (running to nine volumes) was recently published by the U.S. Commerce Department, following a study by the U.S. Congress, which suggested that U.S. labour costs are, per unit of production, no longer significantly higher than in much of Europe and Japan, and that labour costs, once a barrier to U.S. operations, are no longer perceived to be one.

As for the activity in U.S. acquisition by foreigners over the past few months, what are held out to be historically low stock market values for U.S. industry are selected as being an important influence. But perhaps the most controversial, and most widely cited explanation of the wave of foreign immigrant corporations, is political uncertainty in Europe. It is difficult to determine how influential this is because of the natural prejudice of many American bankers for example, against what they see as socialist (rather than social-democratic) trends in Europe.

Many U.S. bankers however stress that their clients, particularly where the company is family controlled have decided to seek expansion in the U.S. partly because they are unhappy about political trends in Europe, or perhaps the



influence of labour unions (Swiss companies of course have another motive, namely the growing difficulty of exporting as their exchange rate appreciates.)

Whatever the importance of these factors, many immigrant companies are locating their plants, as Michelin, the French tyre manufacturer has done, in areas such as South Carolina where much of the labour is non-unionised (and generally cheaper).

By most standards foreign investment in the U.S. is still small and U.S. investment abroad is probably four times as great. According to the Commerce Department payments for foreign affiliates account for under 2 per cent. of non-farm private wages and salaries as up to 3 per cent. of the gross private non-residential investment.

Its greatest significance perhaps is that it is growing much faster than U.S. investment overall, and that it is concentrated quite noticeably in certain business sectors. Thus, in much of Europe and Japan, a senior executive of Uniroil, one of the companies affected by the recent 18 week rubber strike, claimed that the management was resisting the union's demands so strongly because it feared competition from foreign non-unionised tyre manufacturers.

There does not, however seem to be the national, public or political concern about foreign corporate immigrants that was apparent when Arab business interests were feared. Some foreign companies wanting to open up in business here through acquisition are, nevertheless, running into quite a stiff opposition. This in itself reflects a growing movement of some states to help companies and help them resist unwelcome takeovers whether by corporations or foreign states (Some states have special laws relating to foreigners.) There is no doubt either that companies threatened by foreign takeovers are ready to appeal to chauvinism as a defence.

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MEN AND MATTERS

Much more about economists

A couple of weeks ago I was moved to write about the complexities of the system relating to economists employed by the Government, and also to the proliferation in their numbers. (Remember? In 1961 there were around a dozen under Sir Alec Cairncross while now Whitehall can boast 400—plus those at the Bank of England.)

This prompted a colleague to point out that there is no monopoly on economists: stock brokers too are getting in on the action to challenge official academic and banking sources in the forecasting field. How much good it really does for clients is a matter for conjecture, but it can be extremely good for the firms concerned: namely, the free publicity that Phillips and Drew derive from regular radio appearances from their economist Paul Nield, and others either get publicity through different means (the Data Stream computer gave Hoare and Co. Govett a good run before it was hived off), or are striving to catch up.

In France there is an interesting contrast. Professor Raymond Barre, already established as a leading economist, was surprisingly appointed Prime Minister less than a fortnight ago and President Giscard d'Estaing at that time described him as France's greatest living economist.

Since then, as far as Barre is concerned, it has been a case of the job that the economist rather than vice-versa. Since his *Economie Politique* was first published in 1936 it has anyway sold more than 150,000 copies through ten editions, and its author is reckoned to have picked up something like a

quarter of a million pounds in royalties. (Commonly known as "Le Barre", the book is regarded as the Gallic equivalent of Samuelson's *Economics*.)

Now there is every prospect of a great deal more to come. Barre's sudden and unexpected elevation into a top political job has produced an avalanche of new orders—"not just from economic students" according to one Left Bank bookseller.

It is not unreasonable to assume that some of the extra customers are politicians and unionists anxious to get some clue as to their inscrutable Prime Minister's inner thinking: after all there is that famous but mysterious anti-inflationary "austerity" package awaiting France in a week or so from now.

All of which will be encouraging for another aspiring author, President Giscard d'Estaing himself, whose 150-page book setting out his grand design of an "advanced liberal society" comes out at the end of September. The President is understood to have promised the proceeds to a deserving cause. But a small price to pay if the book helps keep the left at bay in the all-important 1978 parliamentary elections.

The background to the story is that Zaire is up to 18 months in arrears on certain foreign loans



"Well, brothers, I suppose we have the Government to thank for enabling so many of you to be here to-day."

currency loans and for perhaps the first time the commercial sector got together to try and organise a settlement (such meetings are not uncommon between governments). However, there is always the danger of acrimony creeping into such meetings and an impartial chairman is an obvious necessity.

However, the word chairman implies perhaps rather more authority than the Zairis or the banks thought appropriate: hence the cast around for an alternative and the emergence of a "moderator."

The choice for the job fell on G. J. MacGillivray—a Bank of England man, although he is at pains to point out that in this situation he acted purely as an individual. His own background made him an obvious choice since he has been involved in a number of similar (but inter-governmental) negotiations over the past 10 years or so in what

has become known as the "Paris Club," since that has usually been the venue for these meetings. He has helped in the restructuring or refinancing of loans for a number of governments during that time, including Chile, Argentina, and Indonesia.

Touche

This story is supposed to be true (although I have a sneaking suspicion that I have heard something in similar vein before). A friend claims that while waiting to get on to the first tee on a local municipal golf course on a recent Sunday afternoon he turned round to discover that the vicar was next in the queue.

Jocularly he asked the vicar, "Isn't it a sin for you to be playing golf on a Sunday?" The vicar smiled tolerantly, but said nothing until my friend hit what could most favourably be described as an unremarkable drive off the first tee. Then the vicar quietly remarked, "My son, it is a sin for you to be on a golf course any day of the week."

A moral tale

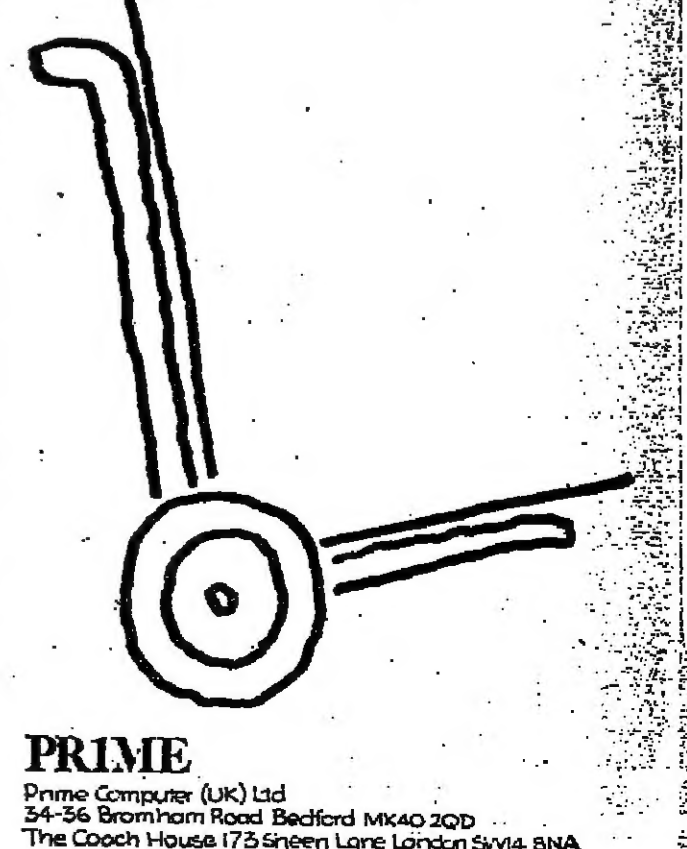
A newly crowned African chief was so impressed with his tribal throne that he became obsessed with thrones in general and started to collect them. As his collection grew he commissioned a local builder to add a loft to his hut where he could store them.

Inevitably, one day, the weight of the accumulated thrones became too much for the supporting roof, which collapsed. The moral of this story is that people who live in grass houses shouldn't stow thrones.

Observer

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This week's Farnborough Air Show will herald a new era in aviation. Heavy purchases of civil and military products are anticipated world-wide in the years ahead, but the scene will also be dominated by changing political, economic and sociological requirements, and fresh patterns of international collaboration will emerge

available worldwide. In the helicopter field, the world market up to 1985 has been estimated at up to 23,000 aircraft of all kinds, of which about 15,000 will be military and the rest civil, at an estimated cost of about \$100n.

Despite the fact that the Bill has been bitterly contested in Parliament, and that some

In this context, it must also be borne in mind that some kind of rationalisation would be

Sales of the Britten-Norman Islander and Trislander remain high, and those of the Short Skyvan and its new SD8-30 Commuter airliner can be considered reasonable in present economic circumstances.

But there can be no doubt that what the U.K. industry needs more than anything else

CONTINUED ON NEXT PAGE

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AEROSPACE II

Outlook

CONTINUED FROM PREVIOUS PAGE

development responsibility, in the production of one or more of the new aeroplanes now envisaged in the U.S.

These include a wide range of types—the Boeing 737 "family" of jets, including a medium-range type, the 737 variant of the short-haul 737 jet, and the McDonnell Douglas DC-X-300—and the U.S. manufacturers themselves have made no secret of their desire to attract overseas partners and finance.

It has long been fashionable in some sections of the U.K. industry to speak disparagingly of becoming "mere sub-contractors" to the U.S. industry. But the fact remains that in a world short of new aerospace designs and cash, especially on the civil side, any kind of work is necessary for long-term survival. While the number of new types of aircraft that will emerge in the future may be limited, it is likely that the numbers that will be built of each type will be substantial. As a result, major sub-contracting programmes are likely to be available for a long time ahead.

While undoubtedly in any discussions with the U.S. the U.K. should strive to achieve some kind of design and development responsibility, matching the cash injections it is prepared to make, sub-contract work should not be despised. For even this will help to keep factories employed, and to maintain contacts with the world aviation scene, against the time when indigenous ventures can again be prepared, with which to attack world markets.

Strive

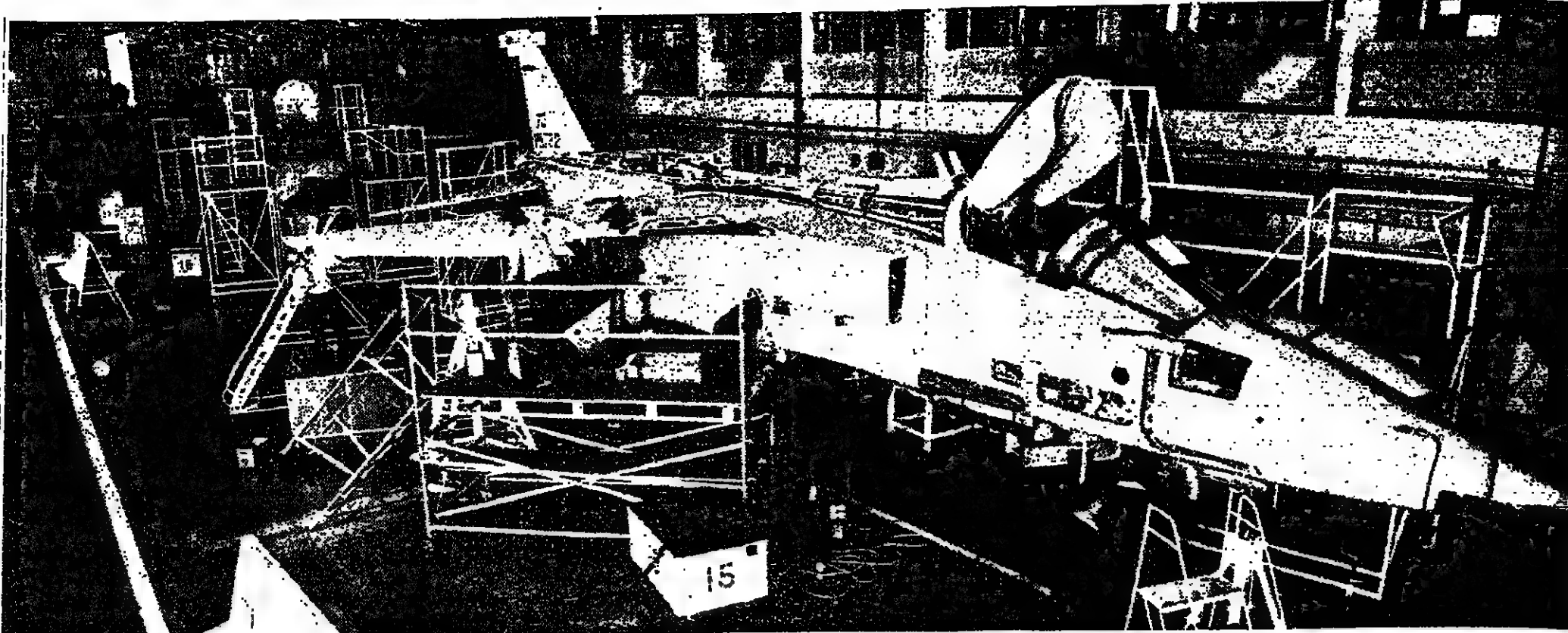
This fact of aerospace life must be accepted if the U.K. industry wants to survive. Unless the U.K. Government

itself is prepared to finance all or the major part of the cost of any new civil ventures—which seems unlikely—it must be admitted that the U.K. is only likely to secure a minority stake in the design, development and production of any new international civil venture, even one that it may initiate itself, such as the HS-146. As a result, any kind of aviation work the U.K. can get in future will be worth having, even if it is sub-contractual rather than basic design and development.

Export

This need for new civil programmes is illustrated most graphically in an analysis of the industry's export performance. Over recent years, the trend has been for exports to rise to new peaks annually, culminating in last year's performance of over £800m. and nearly £450m. In the first six months of this year, while inflation has played its part in boosting these figures, it also reflects the industry's success in selling its wares overseas against continually stiffening competition.

At the same time, the figures do contain an extraordinarily high content for spares—£160m. on aircraft and £140m. on engines (including overhauls) in the first six months of this year. This can be taken as justification for the industry's frequent claims that once any new project is successfully launched commercially, it can go on generating business in after-sales support for anything up to 30 years, thereby justifying launch costs. But the comparatively low level of new sales in the current figures does reflect the fact that many of the existing civil programmes are running down, and that new ventures will be needed to keep the factories fully occupied in the 1980s and into the 1990s.



Assembly of the Anglo-French Jaguar at the British Aircraft Corporation's Weybridge works.

International collaboration

OVER THE past year or so, the production. Unless new orders come in soon at a greater rate than over the past two years, been dominated by the question of what new civil aircraft ought to be developed for the 1980s and beyond, and what new international industrial patterns will be needed to build them. This need for new civil work is becoming urgent. Because of the recession of the past three years, only comparatively few of the world's airlines have wanted to buy new equipment, so the manufacturers' order books have shrunk considerably, resulting in reduced rates of

expected (57 aircraft bought or on option), but even so the number of contracts is below the original hopes. Orders for such short-haul types as the Fokker F27 Fellowship and F27 Friendship Airlines continue steadily, but those for the VFW-Fokker 614 feederliner are exceptionally slow. In France, the Mercure 100 programme has been disappointing. In the U.K., the Fairey Britten-Norman Islander and Trislander continue to sell well, while a small flow of orders continues for the short Skyvan, the HS-748 feederliner and HS-125 executive jet. It is hoped that more orders will emerge soon for the new Short SD3-30 "Commuter" airliner.

But there have been no new orders for the Hawker Siddeley Trident beyond those from China, while BAC's One-Eleven line is currently sustained solely by a small order from Tarom of Romania and the manufacture of five additional aircraft, with Government financial help, in anticipation of orders.

Concorde

In both France and the U.K. moreover, Concorde work is running down fast, with eight of the 16 production aircraft now built and flying, and work on the remaining eight (four at Filton and four at Toulouse) well advanced. There is no immediate prospect of additional production being authorised by the two Governments until the outstanding aircraft are sold, and additional airline orders emerge to justify new financial commitments.

There are signs, however, that the demand situation is changing, and it is hoped that, before the next 18 months are out, some major new programmes will be moving from the project offices, onto the factory floors.

One of the most significant signs is that, with the ending of the recession, world air traffic is picking up again, and is expected to grow at an average annual rate of around 8 per cent. at least until 1981. Beyond that, the airline observers are too cautious to predict, but the general belief is that the expansion by then will be seen to be well established, and therefore likely to continue through the 1990s.

This, in turn, is expected to help the airlines overcome much of the over-capacity situation (too many seats chasing too few passengers) that has plagued them for a long time, often stemming from the substantial fleets of wide-bodied jets they over-ordered before the recession began. It seems likely, therefore, that the airlines over the next year or so will start to look more eagerly for additional aircraft, with which to meet the anticipated expansion in world air traffic. Some are already back in the market for good second-hand jets.

At the same time, many of the airlines will also be looking for replacement aircraft for those parts of their fleets that will be ageing. In many cases, airlines have fleets of long-haul Boeing 707s or Douglas DC-8s, medium-haul Boeing 727s and short-haul Boeing 737s, Douglas DC9s, BAC One-Elevens and other jets that have been in service for many years. By the early 1980s, many of these aircraft will be 15 to 20 years of age. They will also need replacing because of the increasingly stringent environmental regulations, particularly relating to noise, that can be expected by the early 1980s.

The need for increased fuel efficiency, stemming both from rising fuel costs and the need to preserve as much as possible declining fuel reserves, will also dictate the purchase of new fleets. While it is already possible to modify many of these older jets to comply with the

direct cost of doing so is high, involving some payload penalties, while the noise improvements resulting are so marginal that in many cases it seems likely airlines will prefer to phase these aircraft out and buy new equipment.

This is especially so because whatever the airlines buy now will have to serve them for the best part of the next 15 years—through to the early 1990s and perhaps even to the end of this century. They will need, therefore, equipment that goes far beyond today's models in terms of both environmental acceptability and fuel efficiency—in turn resulting in demand for new designs.

Boeing, in a recent analysis of the anticipated world market, suggested that it might amount to as much as \$46bn. (in constant 1975 dollars), or about £35bn. through to 1985, effectively resulting in a market for about 3,000 aeroplanes. Of this market, it suggested that about \$20bn. would be the replacement of existing ageing jets, with the remaining \$26bn. being new purchases to meet the steady growth of air traffic. It further analysed the market as to \$13.8bn. in the long-range field, \$23.1bn. in the medium-range field, and \$7.3bn. in the short-range field, with about \$2bn. in the freighter field.

With this kind of market at stake, the search is on in the world's aerospace industries for the new designs for the future. Because of the high costs of development and manufacture, it is certain that there will be fewer competing designs than in the past, and that each design will be built by an international consortium rather than an individual manufacturer. The days of each aircraft industry in each country producing competing designs to meet the same requirement are over. Collaboration on an international basis is the essential prerequisite for the manufacture of major new civil airliners, although at the smaller end of the scale, in the business and executive aircraft fields, for example, and even perhaps in the short-haul feederliner business, where development costs are lower, some individual manufacturers may still be able to produce their individual designs.

As a result of this situation, however, the search for the new designs to meet the major airlines' requirements is being accompanied by an equally complex pattern of discussions among manufacturers to find the most politically and economically suitable consortia to undertake the ventures envisaged.

Recognised

As Boeing's analysis shows, the manufacturers appear broadly to have recognised that the bulk of the future market will lie in the short to medium-range fields. The very long-range and medium-to-long range markets are already dominated to such an extent by the Boeing 747 and its variants (such as the SP Special Performance model), and the McDonnell Douglas DC-10 and Lockheed TriStar trijets and their long-range variants, that no other manufacturer in the Western world now wants to waste time and money in getting into these fields. The only possible exception to this situation, would appear to be a requirement for a small number of very long-range aeroplanes, capable, say, of 7,000 to 8,000 miles range but with comparatively low payloads of 200 (or even fewer) passengers.

In the short-to-medium markets, however, a big future efficiency, stemming both from rising fuel costs and the need to preserve as much as possible declining fuel reserves, will also dictate the purchase of new fleets. While it is already possible to modify many of these older jets to comply with the

for a 200-220 seater, with a range of 2,500 miles or more. The second is for a 150-b seater, with a range of about 1,500 miles, while the third for a shorter range 80-100 seat type. There are inevitable variations on all of these broad requirements—with the need of some 100 or more scheduled airlines waiting to be met, it is not surprising that there is almost as many ideas as to how to meet them.

During the past few months there have been almost continuous discussions between various aircraft manufacturers in the U.S. and Europe on how to meet those needs. Again, in broad terms, the tendency has been for the European manufacturers and their government to want to see some more closely knit European consortium emerging with which to compete with the U.S. giant while the U.S. companies have been anxious to ensure that the formation of such a consortium does not cut them off from their erstwhile lucrative markets on this side of the Atlantic. The pattern of negotiations has probably been more complex than at any previous time in the history of air transport development, and it is no means settled yet.

Upset

Earlier efforts by the Group of Seven in Europe (comprising BAC, Hawker Siddeley, Messerschmitt-Bölkow-Blom, VFW, Fokker, Dornier, Aeritalia and Dassault-Breguet) to develop a medium-range jet, together with ideas that the U.K. might participate in a B-10 short-medium haul derivative of the A-300 Airbus, appear to have been temporarily upset by the unilateral French proposal for a Mercure 200 airliner, but 45 per cent. by France, 15 per cent. by McDonnell Douglas and 40 per cent. by other countries.

Few in Europe appear to have welcomed this proposal which is seen as cutting sharply across the earlier plan for tighter European co-operation already proposed. It is still subject to detailed discussions, and may yet be either substantially modified or even dropped.

One by-product of this French unilateral decision, however, may be to force the U.K. and other European manufacturers closer together, while it might even result in Boeing of the U.S. itself moving to pre-empt the situation by signing partnership deals with European companies, including those in Britain, a prospect that many in the U.K. are beginning to find increasingly attractive.

Overshadowing these U.K. ideas has been, of course, the uncertainty over the impending nationalisation of the main elements of the British aerospace industry—although to be fair it has been stressed all along by the Organising Committee for British Aerospace that the industry should not allow nationalisation to impede the flow of discussions on what to do next and how and with whom to do it.

This maelstrom of international activity shows no signs of abating.

Nothing has yet been settled. Indeed, it is probable that at this year's Farnborough air show the inter-company and international lobbying will be continuing in the chalets overlooking the airfield. It may be some months yet before any clear strands emerge from the tangled skein of planning the next generations of civil aircraft. All that is clear so far is that one era of civil aviation development is coming to an end, while the one which is being shaped to take its place will prevail through to the 1990s and probably well into the next century.

Michael Donne



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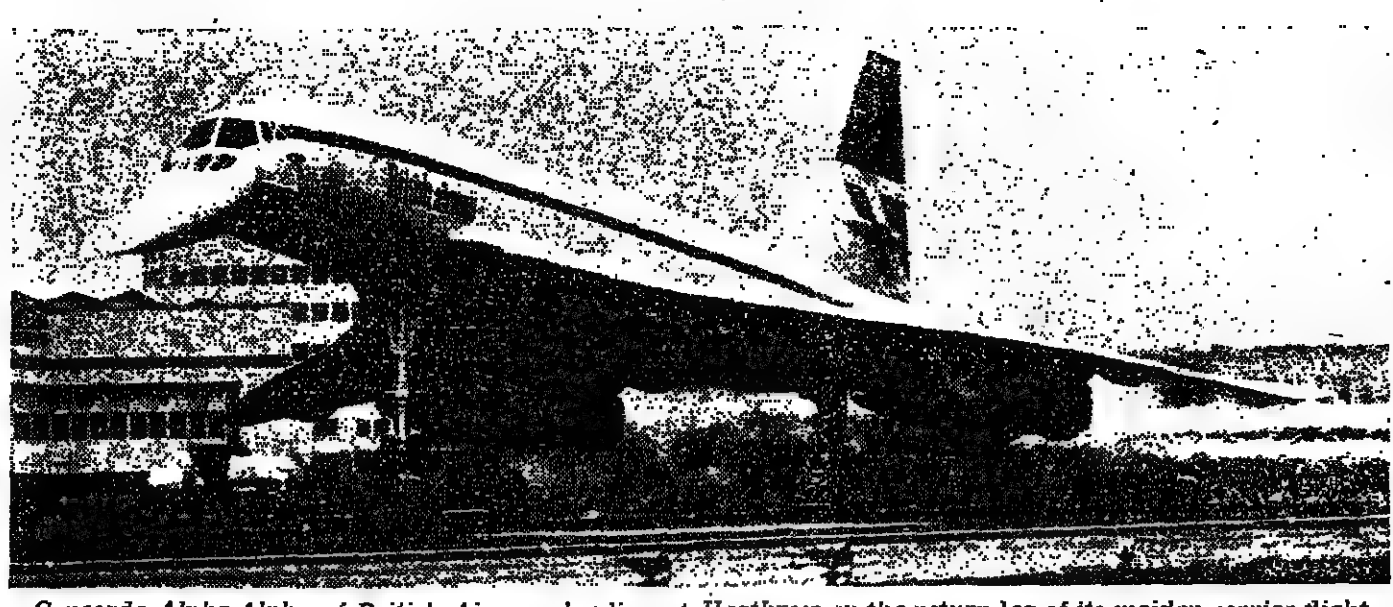
AEROSPACE III

Crucial period for Concorde

WITH THE Anglo-French 30 per cent surcharge on the Concorde, having accumulated normal first-class fare that is over seven months of airline charged for Concorde service, service with British Airways From these preliminary results, and Air France, it can reason the two airlines have concluded ably be claimed that the super-sonic era is here to stay. What remains to be established, and that for this reason the however, is to what extent immediate priority must be the Concorde operations will be expansion of the route network profitable for the airlines, and at the earliest possible date.

It does not seem likely that received for the five aircraft there will be any early settlement to remain to be sold out of the 16 production aeroplanes. ing Concorde operations into originally authorised by the two Governments.

Beyond this, two further questions still to be answered are whether there will be further production orders for the present generation Concorde, and whether a second-generation aeroplane will be authorised in the not too distant future.



Concorde Alpha-Alpha of British Airways landing at Heathrow on the return leg of its maiden service flight to Bahrain.

So far, both British Airways and Air France express themselves well satisfied with the results of their Concorde operations. This is despite the fact that neither airline has yet been able to introduce Concorde on to the most lucrative route of all, the North Atlantic between New York and London, pending a satisfactory settlement of the current legal arguments on this matter (stemming from the six months' ban imposed on Concorde operations at Kennedy International Airport by the Port of New York Authority).

Load factors on the routes between London and Paris and Washington are described by both airlines as excellent, running at over 90 per cent, with a high level of forward bookings, while on the route between Paris and Rio de Janeiro they are exceptionally good, on the route between Paris and Caracas marginally satisfactory, and reasonably acceptable between London and Bahrain. BA has so far carried over 7,000 passengers on its Concorde flights.

The level of customer appreciation has been high, with considerable favourable comment about the substantial savings in time achieved by supersonic flight, and the comparative freshness of the passengers on arrival, with only a few complaints about the

to Concorde operations especially in the summer at Bahrain, for example, which BA would prefer to avoid if it could.

It has been suggested, for example, that the total flying time between London and Melbourne by Concorde would be raised from 14 hours 15 minutes to about 17 hours if the more southerly route were used. Even though this would still be substantially better than the current 23 hours 25 minutes taken by subsonic jets, every minute added to the supersonic time represents a diminution of Concorde's advantage, especially if, as expected, competitor airlines introduce "one-stop" subsonic services on the route with Boeing 747 long-range aircraft in a battle to keep traffic away from Concorde.

There is a possibility that some technical improvements can be made to Concorde to improve its payload-range performance on this route (one being to move the centre of gravity of the aeroplane aft so as to enable the existing tanks to carry more fuel), but even so, the most desirable solution must still be the supersonic corridor across India.

These discussions on Indian over-flying rights have been under way throughout this summer, but no results have yet materialised.

British Airways remains hopeful, however, that sooner or later this situation will be settled, and that some time in 1977 it will be able to extend its Concorde services through to Singapore and Australasia.

Once a Concorde service to Singapore can be established, the whole of South-East Asia and the Pacific basin becomes available to the supersonic airliner, either on BA's own operations or on a leasing basis. Serpentine a diminution of Concorde's advantage, especially if, as expected, competitor airlines introduce "one-stop" subsonic services on the route with Boeing 747 long-range aircraft in a battle to keep traffic away from Concorde.

Significance

For this reason, the current 35 months' trial of Concorde in the U.S., which officially began with the first Concorde flights to Washington last May 24, is of considerable significance. The outcome of this extended period of study into all aspects of Concorde's operation will eventually determine whether or not the aircraft can fly into other cities in the U.S.

But it is also likely to be taken as a yardstick against which the attitudes of other countries will be determined. Final acceptance of the aircraft by the U.S. at the end of the 16 months' trial will not only make possible the start of services to

Concorde is damaging the environment—for example, by so reducing the ozone level as to permit an increase in ultraviolet radiation on earth—still has to produce conclusive results one way or another.

So far, however, both Air France and British Airways have every reason to be confident that the 16 months' trial will be followed by a clean certificate of operational health from the U.S. Government.

It is hoped that long before then, however, the current legal problems that are preventing services to and from New York will have been solved, and that at least some token passenger services will be in operation.

Again, much influence on the New York situation is likely to be exerted by the results of the Washington monitoring programme—which are being published on a monthly basis by the U.S. Department of Transportation. The more that it can be demonstrated factually that Concorde is not as noisy or as damaging as has been claimed, the weaker the case for the continued ban on the aircraft at New York becomes.

Thus the next six to 12 months will be crucial for the Concorde. In that time it should be able to demonstrate to all that it is an acceptable addition to the world's air transport network in both economic and environmental terms. This in turn should convince a number of other major airlines that the aircraft is worth having, and hopefully the remaining aircraft out of the 16 production models authorised can be disposed of. Whether these aircraft will be sold outright to interested airlines, or whether they will have to be leased because of the high initial capital cost of buying them, remains to be seen.

Certainly, at £30m. a time, few airlines can afford them, and there is growing pressure on the U.K. and French Governments to introduce some form of leasing scheme that would enable groups of airlines or even individual operators to get into the supersonic era.

This is important, because upon how the two Governments dispose of their remaining aircraft depends whether or not

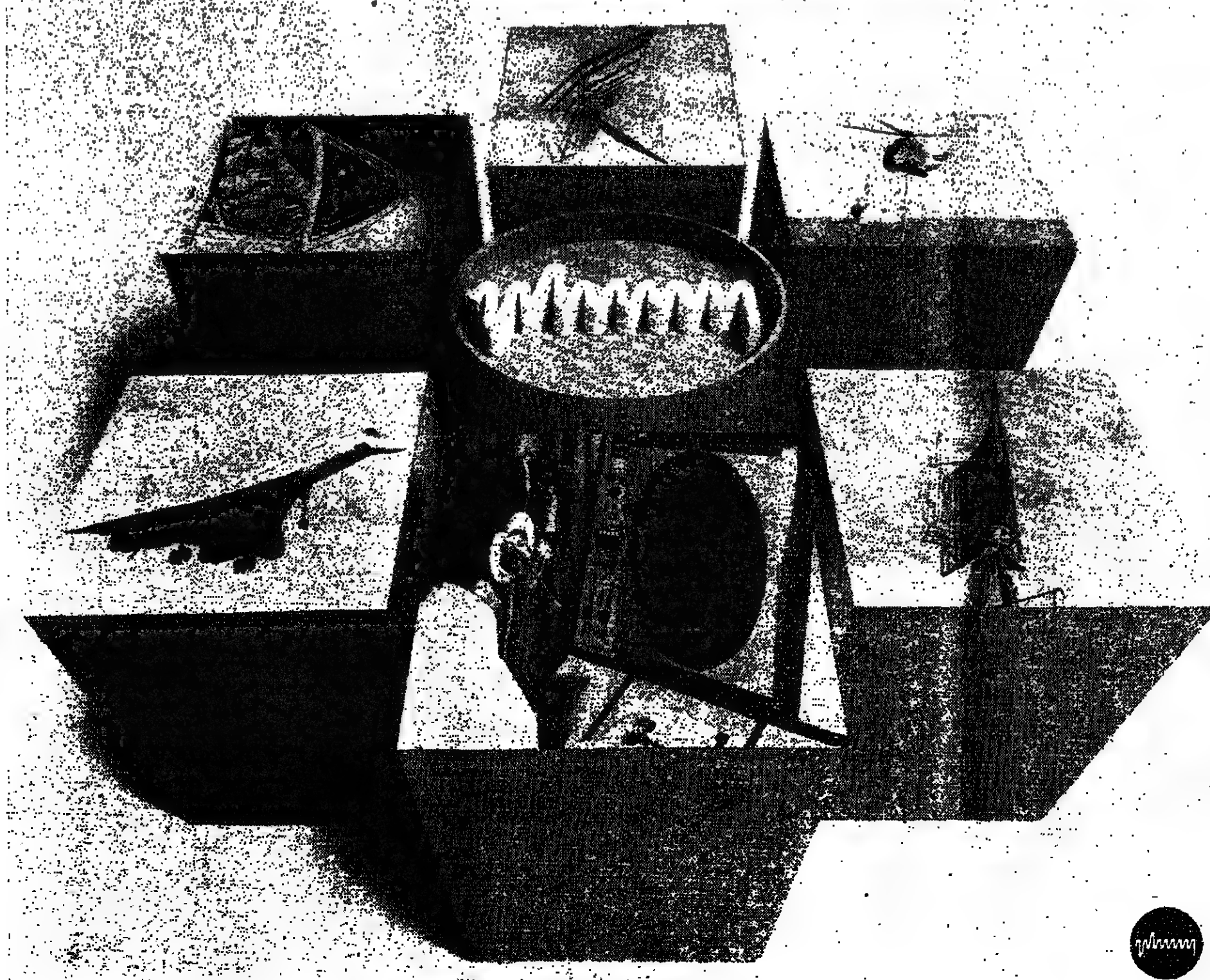
Perform

Everything, therefore, depends upon how well Concorde continues to perform in operational service over the next few months. If it proves to be economical and socially acceptable, other airlines may be stimulated to buy or lease. This in turn will make not only the production of additional aeroplanes feasible, but also encourage other countries to agree to accept Concorde flights to and from their cities—which in turn will help to stimulate demand for the aeroplane. If, however, Concorde proves to be uneconomic, and socially unacceptable, the future of supersonic civil aviation, at least in the shape of Concorde, will be bleak indeed.

There remains the question of any second-generation aeroplane. At present, it seems that this must be some 10 to 15 years away at least, if only because of the high cost involved and the demands of new subsonic civil aviation developments on available government and industry resources. Moreover, any such development would have to be an internationally collaborative venture, with the aerospace industries on both sides of the Atlantic joining forces, and with all their governments also involved (since no individual company or group of companies could afford the cash involved). It seems likely, therefore, both that Concorde and the Soviet TU-144 (which has not yet entered fare-paying passenger service) will have the field to themselves for some considerable time to come.

M.D.

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AEROSPACE IV

The next generation of aero-engines

IN THE aero-engine field, as in the civil airframes industry, the manufacturers' minds are dominated by thoughts of the big markets that lie ahead for a new generation of airliners, especially in the short-range and medium-range categories, that will require a new generation of engines.

In fact, these new airline markets of the future are only likely to emerge when the aero-engine manufacturers can satisfy the airframe manufacturers and the airlines that they are capable of producing power-plants that will meet the increasingly stringent noise regulations and equally tough demands for greater fuel-efficiency, that will prevail not only through the 1980s, but into the 1990s and even perhaps the next century.

The life of any modern aero-engine now extends well over 20 years, because the soaring development and production cost of any "new technology" power-plant is so high that it takes that length of time to recoup the development costs and earn profits.

At the same time, these same high development costs are making it virtually impossible for any one manufacturer to undertake a major engine development on his own, so that international collaboration is becoming the accepted rule in aero-engine development as much as in airframe development.

It has also become clear that while markets for individual successful engines are likely to be substantial, there is no room for more than two or three competitive engine designs in any of the major categories involved—short, medium and long-range.

In the long-range "big engine" field, the battle is still between the three giants—Rolls-Royce with its RB-211, Pratt and Whitney with its JT-9D and General Electric with its CF6 series.

In the big medium-range market that is likely to open up in

the 1980s, it is possible that smaller-thrust derivatives of these big-thrust engines may be developed while another possibility is that a new generation of smaller engines may also emerge, depending entirely on what size of aircraft the airlines choose to suit their future needs.

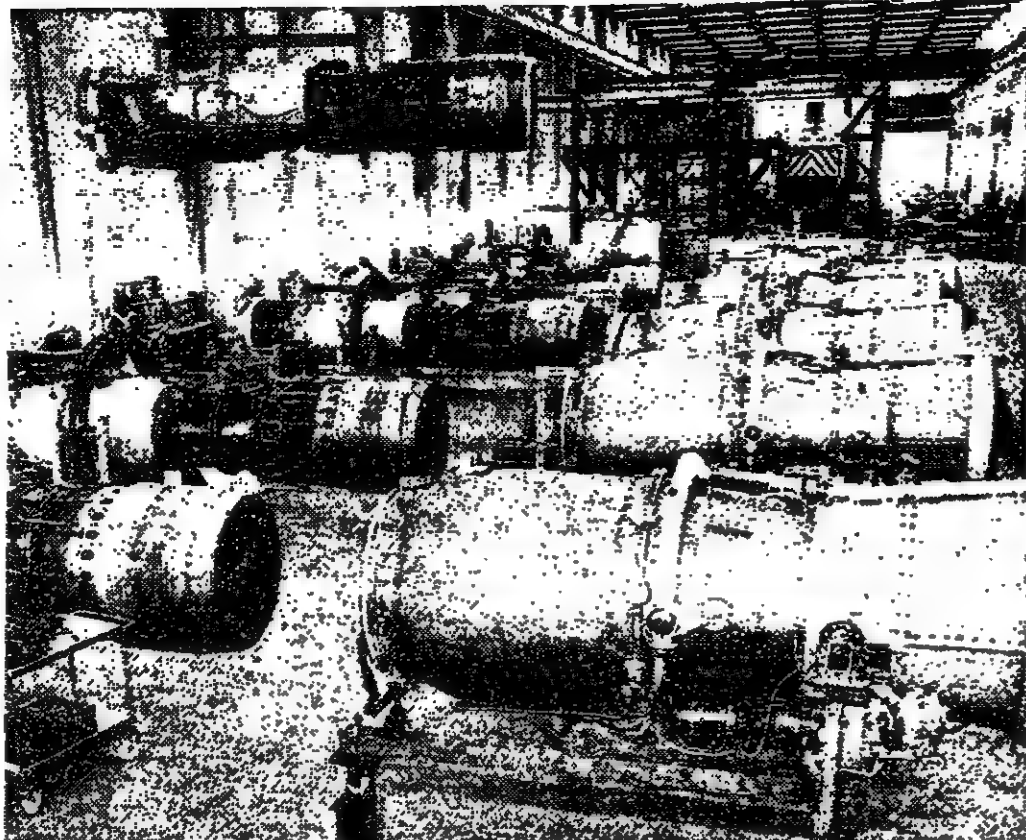
In the short-range field, Rolls-Royce has developed the new RB-401, a "Viper replacement" primarily intended as a power-plant for the next generation of business and executive aircraft, but which could also power the smaller 100-seater transports that are envisaged for the future, together with military aircraft and heavy helicopters. At present, Rolls-Royce is still discussing with the U.K. Government the question of some financial support for the development of the RB-401.

World market

But it is in the medium-range field that the biggest commercial engine battle of the future is expected to lie, since the new generation of short-to-medium range airliners is expected to account for about half the total world market of some \$46bn. for airliners of all types through to 1985, with further substantial sales beyond that.

Various estimates have been made of this world market, but it is thought unlikely to amount to less than 3,000 aeroplanes, of which a round 1,500 are likely to be in the short-to-medium range categories. Since each aeroplane is likely to be either twin-engine or three-engine, the engine market in these classes alone is likely to amount to some 4,500-5,000 units, including spares.

The precise nature of the power-plants for this new generation of short to medium-range airliner cannot be determined until the airlines themselves have made it clear whether they want a twin-engine or three-engine aircraft. If they opt for a twin,



Production of Rolls-Royce Spey turbofan engines.

the market could probably be met adequately by "de-rated" versions of the existing big thrust engines, like the RB-211.

If, however, they want a three-engine aircraft, then there will be a demand for a new breed of engine, such as the already-proposed Pratt and Whitney JT-10D, on which Rolls-Royce has been discussing the possibility of collaboration.

While both Pratt and Whitney and Rolls-Royce, together with MTU and Fiat, have done some work on the power-plant, and a "demonstrator" engine has run on the test-bed in the U.S., the final details of the collaboration between these four companies has yet to be settled.

Whereas originally, the JT-10D had been considered virtu-

ally a certain development for the future, its position has been rendered less certain by this doubt about future airline twin-engine or three-engine needs.

It has been estimated that the overall development cost of the JT-10D could run to as much as \$400m. or more, so that the 34 per cent share that Rolls-Royce might have (with Pratt and Whitney having 54 per cent, MTU 10 per cent and Fiat 2 per cent.) would cost about £150m.

In the meantime Rolls-Royce continues to push ahead with its own big engine, the RB-211, competing with Pratt and Whitney on the JT-9D and General Electric on the CF6 series.

So far as the 42,000 lbs thrust version of the RB-211 is concerned, the Dash 22, Rolls-Royce is making payments to the Government, which amounts to a profit for the latter on its early investment in development of that engine. The Government will receive £50m. of profit payments for the first 555 RB-211s. This compares with a loss of up to £45m. which was forecast in 1971, when the old Rolls-Royce (1971) was established.

Over 540 RB-211s have so far been produced, and this engine has become the biggest export programme of the U.K. aerospace industry, with engines and spares worth more than £420m. already manufactured, mainly for export. Last year, the engine earned £96m. in foreign currency, mainly dollars, for engines delivered to Lockheed for use in the TriStar tri-jet.

After Rolls-Royce (1971) was formed five years ago, it was predicted that the RB-211 programme could cost the Government up to £195m., including the prospective loss of £45m. mentioned, on the first 555 engines, because manufacturing costs were expected to exceed payments received from customers. However, this loss has turned into the £50m. profit as a result of improved efficiency by Rolls-Royce, and more advantageous conditions than originally forecast. Instead of costing the Government £195m., the net cost will be only about £115m., and this has been achieved during a period of unprecedented inflation.

Levy payments

The Government will continue to receive a return from the RB-211 after the 555th engine has been sold, through a levy of 7 per cent of the selling price of each additional engine. It has already received substantial levy payments, returning all its investments in the earlier Dart and Spey engines.

Rolls-Royce has also developed a 50,000 lb. thrust version of the RB-211, the Dash 324, which will enter service next year powering the long-range Boeing 747 Jumbo jets ordered by British Airways and TriStars ordered by Saudi Arabian Airlines. Launch costs of the Dash 324 are expected to be about £80m. These are being shared by Rolls and the U.K. Government, with the company paying £45m. and the Government contributions again recoverable through a levy on sales. The development of the Dash 324 has widened the market for the RB-211, since in addition to the 747 and TriStar it is being specified for two new aircraft—the long-range L-500 variant of the TriStar and the McDonnell Douglas DC-X-200.

The engine is also considered suitable for the new

developments now envisaged of the future, its position has been rendered less certain by this doubt about future airline twin-engine or three-engine needs.

Collaboration

In the military field, the other major international collaborative engine programme now under way is the RB-199 engine for the European Anglo-German-Italian Tornado multi-role combat aircraft. This engine is being developed and manufactured by a consortium comprising Rolls-Royce, Motoren-und-Turbinen, Union, and Fiat, called Turbo-Union. It is estimated that eventually upwards of 2,000 engines will be required, including spares, for the 800 Tornado aircraft that will be built over the next ten years, including 385 for the RAF, 324 for West Germany and 100 for Italy.

Thus, the RB-199 will involve a production commitment that matches American orders in size, and which will be the largest of its kind ever undertaken in Europe. Since manufacturers "learning curves" favour the larger production runs, it is expected that the costs of the RB-199 will be lower than they might otherwise have been if smaller quantities were ordered.

At this stage, with emphasis on the Tornado, it is not known whether the RB-199 will find uses in other military aircraft for the future, but on past experience it seems more than likely that derivatives of it will emerge over the next 20 years or so, so that it will become one of the world's great military engines.

Among its other major engine programmes, that are likely to sustain the company in the future, are the military Adour programme, and the civil Spey and Dart. The Adour engine powers both the Jaguar strike/trainer and also the Hawker Siddeley Hawk which is on order for the RAF, and the Japanese T-2 strike/trainer.

Over 950 Adour engines have now been delivered for these three types of aircraft. Orders have been placed for more than 700 Adour-powered aircraft, of which over 300 have been produced. Further development of the Adour to higher powers is in progress, and market forecasts indicate that total Adour production will exceed 8,000 engines.

The Spey turbo-fan has now been in service for over 12 years, and has accumulated over 133m. running hours with the eight types of civil and military aircraft it powers. More than 4,300 civil and military Speys have now been built or are on order, while in addition Rolls-Royce has an £80m. agreement for the manufacture of the military Spey in China, and for an initial supply of those engines.

The Dart engine, first developed 30 years ago, is still one of Rolls-Royce's major money-spinners, in the Hawker Siddeley HS-748 and Fokker F-27 airliners. Over 6,700 Darts have been built, and new engines continue to be built at a substantial rate.

M.D.



View from the window of a Lockheed TriStar showing one of the three Rolls-Royce RB-211 turbofans.

Private flying levels out

DESPITE the many unfavourable factors over the past few years which should have been detrimental to private flying in Britain, most clubs continue to attract new business and some have had to refuse new members. But, the number of light aircraft being sold to individuals and clubs has suffered considerably from high costs, which have been further escalated by the devaluation of sterling.

With around 90 per cent. of these aircraft coming from the U.S., the currency problem has been even more acute and the price of an average aircraft has risen to between £35,000 and £30,000. As a result, the price of second-hand models has also risen sharply.

On the other hand, the cost of gaining a licence has, in relation to other leisure activities, remained fairly stable. Charges now range between £15 and £20 an hour and expenditure of about £500 to obtain a private flying licence is considered average.

As one club points out, this is not excessive when compared with the average holiday abroad. It is felt that the element of escapism involved in learning to fly is one of the major attractions, despite the overall fall in the level of disposable income brought about by economic conditions.

Difficult times

The level of private flying activity is estimated to have remained stable in the past two years, with a notable increase in the north of the country. This year the favourable flying conditions have also contributed to the overall position.

But times have been difficult for smaller and less financially healthy clubs, and a number of these have closed, with the larger operators apparently gaining the displaced membership. Similarly, there are reports that the number of individuals maintaining their licences has dropped.

In Europe, there has also been a favourable level of activity, particularly in France, where Government policy on providing facilities for private flying has been an important factor in boosting public interest.

British policy for the South-East was outlined earlier this year in a Civil Aviation Authority document entitled Airfields

for General Aviation in South East England, which was the second report of the Standing Conference on London and South East Regional Planning and the Civil Aviation Authority.

In the first document a number of projections on traffic volumes were made. Aircraft movements in the flying club sector were expected to rise from 985,000 in 1973 to 1.7m. in 1978, and business and recreational use from 84,000 to 180,000.

These forecasts were based, however, on a number of critical assumptions, the second document points out, in particular that the economic growth rate for 1973 to 1985 would average at the historical long-term growth rate. It was assumed that in the long run fuel prices would stabilise but that recreational flying would be much more sensitive to any increase in fuel prices than business flying. In the event, fuel costs had risen at a lower rate than was experienced in 1973 and 1974.

The report concluded that it was too early to give an estimate of the extent to which the patterns of demand were following the trend projected, but recent statistics suggested a setback in levels of activity since the preparation of the forecasts. The depth of the recession made it unlikely that the 1985 forecast levels should be reached before the late 1980s.

It was emphasised that in view of the long-term nature of the exercise, the precise year in which the forecasts were achieved was not in general critical to any proposed solutions to problems.

A number of factors besides the increased price of fuel were responsible for the fall in the rate of growth of general aviation activity. These included the imposition of a higher rate of VAT on general aviation aircraft and the unusually wet winter of 1974-75. However, suggestions that tax incentives may encourage the purchase of aircraft were not borne out by any evidence, the report said.

In some respects the recommendations made in the report may be discouraging private flying interests. For example, it is suggested that at airfields where situations of conflict arise in the accommodation of growth in both business and recreational flying, priority should be in most circumstances

be given to the business sector. The rationale for this is the demand for business flying is likely to grow faster than any other form of general aviation and is commercially most important. But the report adds:

"The few airfields most appropriate for business activity should concentrate upon the accommodation of future growth in business aviation although not necessarily to the exclusion of recreational flying."

Six airfields have been named as the most appropriate for accommodating more of the expected growth in demand for business activity: these are Leamington, Northolt, Biggin Hill, Blackbushe, Shoreham and Southampton. It is pointed out, for example, that Biggin Hill's potential for handling business activity is limited by its extensive use by flying clubs.

Congestion

The report comes to the conclusion that existing facilities will in general be adequate to meet predicted levels of demand for recreational flying. It adds, however, that there is likely to be some congestion at peak hours and it was considered that for the foreseeable future such congestion would have to be accepted.

Nevertheless, there were certain airfields where congestion was likely to reach intolerable levels unless action is taken, most notably at Biggin Hill. For that reason, no further growth in recreational flying at Biggin Hill was desirable.

It is suggested that a substantial proportion of growth in club activity there might be displaced by increased business traffic and should be transferred to West Malling. Similarly, private flying at a number of more centralised airfields is likely to be transferred to more rural areas if the policy outlined is put into effect.

The effect of such a policy on private flying, if pursued on a country-wide basis, would certainly not be of benefit to the level of activity, most experts agree. Furthermore, seen in the context of the U.S., where municipal airports have been specifically developed and where 95 per cent of airports do not charge the user, U.K. policy would appear to be lagging behind.

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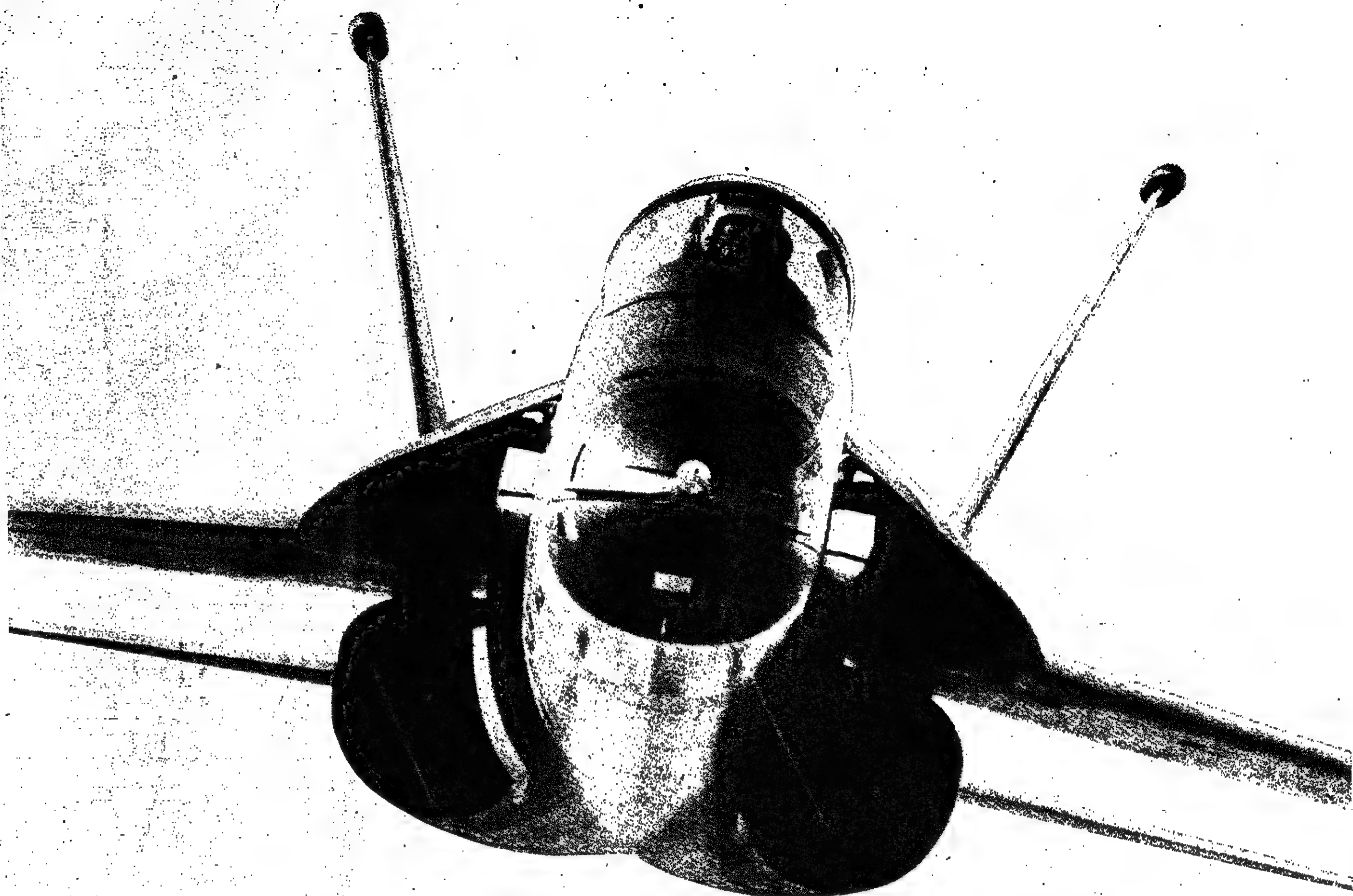
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AEROSPACE VI

The scope for business aircraft

ALTHOUGH business flying continues to be a growth sector of world aviation, Britain and Europe continue to lag well behind the U.S. in their use and application of these aircraft. But if the level of business flying in the U.K. has yet to recover from the effects of the increases in fuel and overall operating costs over the past three years, it is in general better than expected in view of economic conditions.

In Europe, sales of business aircraft in West Germany have been encouraging, although manufacturers continue to be of the opinion that the structure and density of surface transport facilities already available in EEC countries means that this market will always be limited when compared with the U.S.

However, a recent study carried out by Frost and Sullivan

gives a more optimistic view, suggesting that expenditure on general aviation aircraft in 1986 will be £1.1bn. at end-1975 values. They predict that growth will resume next year and that £393m. will be spent up to 1980 and, given greater economic activity, £613m. between 1981 and 1986, an increase of 56 per cent.

The study finds that most of the growth in EEC countries is expected to be in business flying, which will benefit from increased business activity and the flexibility not offered by commercial flight. Helicopters are expected to expand their market share significantly.

Sales of more than 2,400 twin-engine aircraft, worth £420m., are expected to dominate the next decade, followed by nearly 14,000 single-engine aircraft

worth more than £200m. and nearly 1,500 helicopters worth £164m.

A market for 190 aircraft of heavier than 5.7 tonnes is forecast, worth £139m., with buying expanding by 33 per cent. in the period 1981-86 over the preceding five years. Britain and West Germany are expected to share equally 73 per cent. of the 10-year market for 28,000 aircraft, with France's share reaching only 13 per cent. and Italy's 4.6 per cent.

Burden

Britain is also seen as the major market for aircraft over 5.7 tonnes and for helicopters, and will be the second largest buyer of twin-engine aircraft. West Germany will be the prime buyer of both single and twin-engine aircraft.

An annual growth rate of 2.5 per cent. in general aviation traffic movements is expected up to 1986, which would lead to increasing use of instrument flight rules and a greater burden on the EEC air traffic control system.

As a result, business aircraft and air taxi services are expected to carry at least VHF, VOR, NDB and SSR transponder equipment. There is a likelihood that a form of height reporting will be mandatory in the EEC by the end of 1978.

However, this long-term projection must be seen in the context of world trends, well illustrated by the fact that Brazil alone will buy about three-quarters as many general aviation aircraft as the whole of Europe. In the U.S., because of the impetus given to business aviation by Federal and State policy on airports, and for geographical reasons, the booming market can be expected to continue.

The Piper Aircraft Corporation, which produces more twin-engine aircraft than any other manufacturer in the world, is enjoying an excellent year, with increased sales, and claims greater market penetration, particularly with its Navajo range.

Recent figures collated by Piper show that there were 4,845 general aviation aircraft in the U.K., of which about 1,000 were Piper manufactured, with Cessna in second place with 790 aircraft.

The U.S. General Aviation Manufacturers' Association pointed out recently that the foremost factor in the general aviation market place was the growing recognition that it was



The Cessna pressurised 421 Golden Eagle.

a transport tool. In the U.S. airlines, this trend is clearly the 14,000 a year built by it served all 13,100 airports, including 435 covered by scheduled airlines.

Recent cutbacks in airline services and the continuing 55 mph road speed limit, as well as the recently discovered fuel efficiencies in aircraft, were study has shown that 64 per cent. of business aircraft are single-engine. The U.S. has about 150,000 single-engine piston aircraft, of which 29,000 are placed by the Federal Aviation Administration in the Series 700, a fan-jet powered aircraft with longer range and greater payload.

The European light aircraft industry manufactures about 1,000 units a year compared to

of the small businessman.

There has also been a trend in the business aircraft field comes at the other end of the range, namely in the Hawk Siddeley HS-125, of which around 600 have been sold since it was launched in 1972. Now great hopes are being placed on the HS-125 Series 700, a fan-jet powered aircraft with longer range and greater payload.

Despite the depressed state of U.K. demand, there has been

a surprisingly strong response to the new model, launched in the early summer, with already sold and with good prospects for the sale of another 10. The future of this aircraft in major markets such as the U.S., Europe and Australia, the Far East, is seen as extremely promising.

In the U.K., the fall in selling has increased the cost of buying a foreign aircraft, while giving Hawk Siddeley some advantage in its market sector, its overall effect on business flying in general, with high proportion of aircraft being imported, is detrimental.

Interlining

There is also continuing concern in Britain over the availability of suitable airports for business aviation, particularly in relation to the need for interlining. Recent consultation documents from the Government on both regional and national airport policy have given any great cause for confidence.

The use of Heathrow remains in the balance, with indications that smaller aircraft will slow be eased out as the volume of scheduled traffic builds up. Gatwick will offer some isolation, but major developments are expected to take place at other airfields. A question mark continues to hang over Northolt, but Leavesden, Blackbushe, Biggin Hill, Shoreham and Southampton have been suggested for development.

Lorne Barrie

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Cargo traffic on the upswing

ALTHOUGH WORLD air cargo traffic has escaped the buffeting to which passenger traffic has been subjected, its rate of decline which set in shortly after the turn of the decade has been causing a good deal of anxiety both to the airlines themselves and to the air forwarders.

But if the monthly tonnages carried by most of the international airlines since the earlier part of this year are measured against comparable months of last year, the indications are that air cargo traffic has emerged from its recession and is once again on the upward trend. That, at any rate, is the view of most airline cargo chiefs and executives of the major forwarders who prefer to back their own judgment rather than that of the professional forecasters.

At the same time, there is considerable doubt as to whether there is ever likely to be a return to the heady levels of growth—ranging between 17 and 31 per cent. a year—to which cargo traffic soared during the latter half of the 1960s and the early 1970s. Since then an average rate of growth of around 7 per cent. is all that the industry has been able to manage, and the most optimistic prediction for 1980 is 10.5 per cent. and a maximum of 11.4 per cent. by 1983.

There are, however, many factors that could distort these forecasts—and not necessarily to the detriment of the industry's recovery. Already developments are under way which are likely to have far-

reaching implications upon the whole concept of air distribution and which, if history repeats itself, could catch the industry on the wrong foot just as happened in the mid-1960s. Then, handling facilities and carrying capacity proved inadequate to cater for the sudden and unexpected upsurge in traffic. It arrived before schedule, and in so doing pipped the post plans that were being implemented for the installation of automated handling equipment, the construction of separate cargo terminal buildings and for the increase in the frequency of all-cargo services as well as the conversion of aircraft for their operation.

Aware

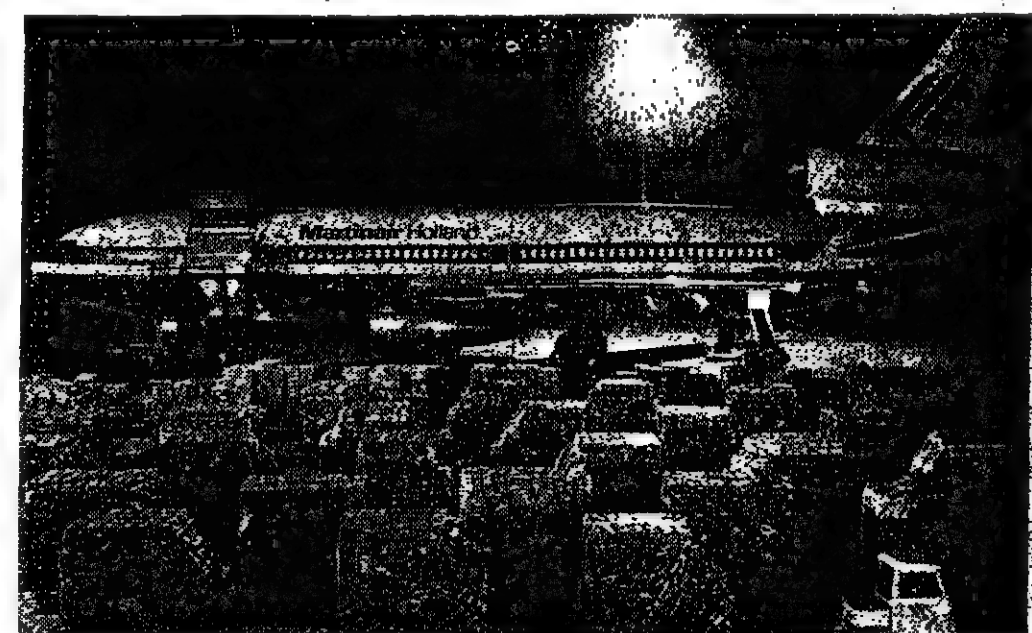
By the same token the air forwarders had become aware of the rôle they would have to play in future development and were beginning to expand and modernise their facilities and to develop consolidation services which until that time had been regarded with a certain amount of reserve but which now account for about 70 per cent. of all traffic moving on scheduled services.

To-day, the industry—and more particularly the scheduled carriers—is thinking not so much in terms of equipment and facilities but in improving what is referred to as the "cargo product," the main ingredients of which are speed, service reliability and a rate to match. The airlines believe that once they have found the formula to produce the right mix of these four essentials they will have in their hands an incentive which will be difficult to resist by shippers who use air freight only occasionally when the benefits of regular use are spelled out to them.

One of the most formidable problems the scheduled carriers have to face in their search for the ideal cargo product is the challenge of the charter services provided by the independent operators. These are now so highly organised and, in most cases, so efficiently operated that they are attracting increasing volumes of traffic away from the scheduled operators.

Currently, their services proliferate on routes to countries in Africa and the Middle East and to Hong Kong. But the structure of the scheduled airlines' operations lines and ultimately towards enables them to change direct almost overnight and concentrate their services on any country where there may be a shortage of capacity on scheduled services—as has been the case, for example, during special low rates in return for the past year with Nigeria.

The frequency of the services they are able to mount—compared to those of the scheduled carriers—and the low rates they are able to offer—often 50 per cent. below the lowest obtainable on a scheduled flight—year to make up the contractual have captured the imagination of shippers and forwarding place any restriction on the agents alike. So much so in nature of the contents.



Palletised cargo awaiting loading on a DC-10 of Martinair, one of the independent charter operators.

the case of the latter that many of them now automatically ship consignments tipping the scales at 1,000 kilos or more on charter rather than scheduled services.

Although the increasing activities of the independent operators and the increasing share of traffic they are attracting to themselves are causing a good deal of concern to the scheduled airlines, there has as yet been little visible sign on the part of the latter of attempts to counter the competition from the former.

Obvious

If and when the scheduled carriers do decide they must act, the most obvious step open to them would be to start operating split charter flights at comparable rates and on the same routes as are now dominated by the independent carriers. Under existing regulations, airline members of the International Air Transport Association (IATA) are precluded from doing so, but these could well be changed at the Association's bi-annual cargo conference to be held early next year.

In the meantime, British Airways (BA) has made a move which, if put into operation, could go a long way towards altering the whole rating structure of the scheduled airlines' operations lines and ultimately towards narrowing the rates gap between scheduled and charter flights on all routes.

The airline has produced a scheme under which shippers scheduled services—as has been the case, for example, during special low rates in return for the past year with Nigeria. entering into a contract to ship a given tonnage over a period of a year. The rates set by British Airways are for 1,500, operated by the scheduled 1,000 and 500 tonnes, and there is no restriction on the weights of the individual consignments cent. below the lowest obtainable on a scheduled flight—year to make up the contractual have captured the imagination of shippers and forwarding place any restriction on the agents alike. So much so in nature of the contents.

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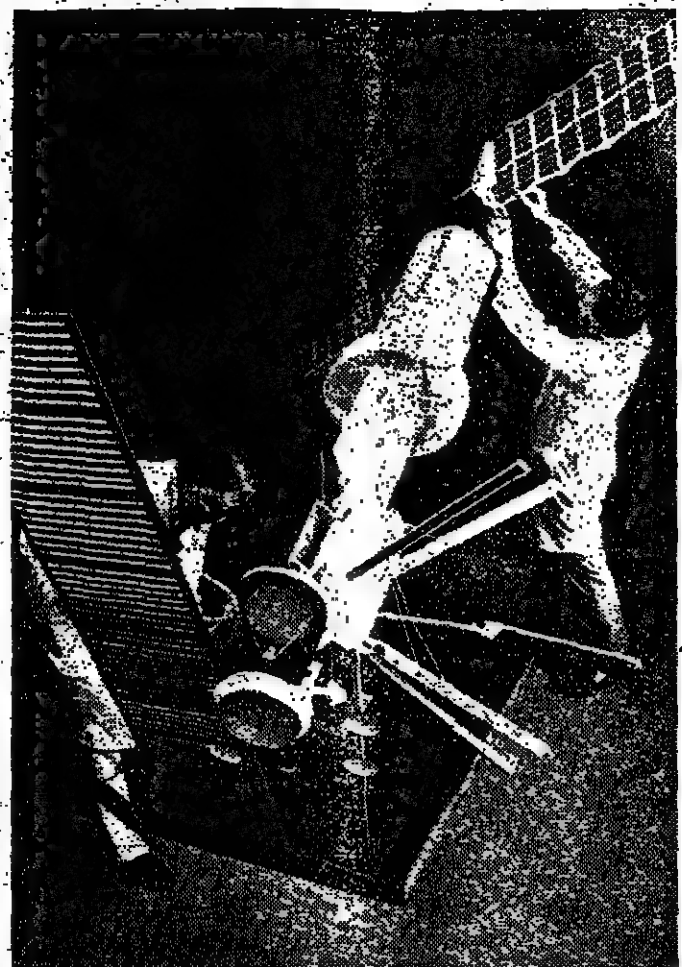
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مكاتب الأمل

AEROSPACE VII

Glamour fades from space research



Model of the Seasat orbital satellite—built for NASA by Lockheed Missiles and Space Company—which will monitor the world's oceans.

MUCH of the glamour that accompanied the early years of space exploration in the late 1950s and 1960s has now evaporated, and space attracts far less public interest and excitement than it did.

There are several reasons for this. One was the growing awareness on the part of the governments and taxpayers who put up the money for space ventures that these were threatening to become a bottomless pit unless more rigid control over spending was introduced. Another was that despite the undoubted technical success of the manned Apollo lunar landing programme, there was some disappointment on the part of the public that there were not greater direct and tangible benefits stemming from it.

Coupled with increasing pressures on available monetary and manpower resources from other directions, these factors have led to a progressive shift in emphasis in space activities in recent years, away from many of the grander aspirations of the scientists towards the more immediately rewarding aspects of space research, such as the greater use of the unmanned near-earth orbiting satellite, for both scientific research and direct technology applications.

The total number of unmanned spacecraft put into near-earth orbit from October 4, 1957 (when the first Soviet Sputnik was launched) until end-1975 was 1,140, of which 739 were still in orbit at the latter date (the others having been destroyed on re-entering the atmosphere). Many of these satellites have been military spacecraft for a wide variety of missions, but increasingly in recent years the balance has swung towards civil satellites of various kinds for scientific research or technological applications.

Shift

This shift has occurred just at a time when substantial advances are beginning to emerge from the largely unpublished reports that have been put into the development of unmanned satellites over the past ten to fifteen years. As a result, the manned satellite is already achieving some substantial breakthroughs in the advancement of man's knowledge about his near-earth space environment, and is almost daily demonstrating its capacity to extend those benefits further into the decade ahead.

It seems likely, therefore, that while countries such as the U.S. and the Soviet Union will continue to devote substantial funds to unmanned interplanetary probes, such as the recent successful U.S. Viking spacecraft landings on Mars, an increasing share of future space spending is likely to be concentrated upon the more immediately rewarding development of near-earth space.

The most rapid advances in this field have been in the use of near-earth satellites for communications purposes. It is now little more than 11 years since the first commercial geostationary communications satellite, Early Bird, was launched from Cape Canaveral (as it was then known) on April 6, 1965. It followed a series of experimental spacecraft, such as Score (the first communications satellite), Echo I and II, Courier, Telstar and Syncom, the first of

the geostationary satellites (the name given to satellites whose orbital speed is so geared to the earth's own rotational speed that they remain virtually in one spot over the earth's surface).

Since Early Bird, with its 66 telephone circuits, the expansion has been steady, though the 240 circuits of Intelsat II (so named after the International Telecommunications Satellite Consortium) which was launched in 1966, and the 1,500 circuits of Intelsat III, and most recently to the 3,750 circuits and two TV channels of Intelsat IV, while the ground network has expanded to more than 118 earth stations in 78 countries providing round-the-clock service with near 100 per cent reliability.

Continuing this line of development, Intelsat is already working on the Series V "Comsat" which will come into service around 1979-80, providing users with another considerable increase in capacity, each having 12,000 two-way voice circuits. In the meantime, so as to preclude system saturation before that date, it is planned to place in orbit from later this year a number of Intelsat IVA satellites of an improved design and each with capacity of over 6,000 two-way voice channels and two TV channels. While, hitherto, the development of the communications satellite has been largely for telephone, telex, telegraph and TV purposes, the further advances now envisaged in "Comsats" include their use for wide-band data exchanges, especially between computers and data-banks; with the distribution of this and other types of information to a growing number of users, especially in banking, commerce and industry.

But other uses are also proposed.

Satellites are already being extensively employed for such things as weather forecasting, and the monitoring of Earth's resources—minerals hunting, detecting fish-shoals, and planning land reclamation, for example—while some specific new satellites now under development envisage big improvements in both maritime and aeronautical telecommunications and aerial navigation.

This trend is likely to continue, and satellite design itself has reached the point where a basic "bus-type" satellite chassis can be built containing the essential signal reception and transmission equipment and power sources, on to which can be added specific items of equipment for almost any kind of task.

Segment

An example of this "bus" type of satellite is the Orbital Test Satellite (OTS) now under development by the European Space Agency, for launch in 1977. While intended to test the space segment of the projected European Regional Communications Satellite System for the 1980s, the OTS is in fact also virtually a "modular" type spacecraft which can serve as a basis for a wide range of "applications technology satellites". The basic OTS design is already being adopted for the ESA's Marots maritime communications satellite programme, for launch towards the end of 1977, and for the Aerosat aeronautical satellite for launch before the end of 1979.

It is becoming clear that this trend towards finding new applications for satellites will continue, resulting in increasing pressures on available launch capacity through the 1980s. At present, only a few countries outside the U.S. and the Soviet Union have satellite launching

capacity of their own, so that by far the greatest volume of future launches in the Western world will have to depend upon the facilities offered by the U.S. National Aeronautics and Space Administration. These are already becoming crowded, and the situation could become worse in the 1980s as world needs coincide with the increasing requirements of the U.S. itself for launch capacity.

It is to meet this situation that the U.S. has already begun the development of a new system of satellite deployment—the "Space Shuttle" plan for a manned, reusable "space transport system."

Deploying

This is the most revolutionary concept of space application yet devised, and while it owes a considerable debt to the vast amount of knowledge acquired during the Apollo manned lunar landing programme, it carries the concept of men living and working in space much further. The basic aim of the system is to provide a means of deploying satellites in orbit, which could perhaps eventually make existing rocket launcher facilities obsolete, while also extending the ability of mankind to undertake other tasks in near-earth orbit.

The Shuttle will comprise two main elements, a Booster and an Orbiter. The Booster will inject the Orbiter into orbit, and will then fall into the sea for recovery and refurbishing for further use. The Orbiter, however, after completing its mission, will return to earth and land like an aeroplane on a runway specially built at Cape Kennedy in Florida.

The Orbiter will be capable of staying aloft for missions of up to 30 days, during which time its crew will be able to perform a wide range of tasks, including the deploying and retrieving of satellites in orbit, the servicing of satellites, the operation of manned laboratories for astronomy, Earth sciences, space processing and manufacturing, and the development of a permanent manned space station. The first Space Shuttle launch is planned for 1980.

An integral part of the Orbiter will be the Spacelab, a small manned "space laboratory" which is being built in Europe by the ESA, that will fit into the Orbiter's cargo bay, and enable small teams of scientists to work in near-earth orbit in shirt-sleeve comfort, and for periods of up to 30 days at a time. Current NASA planning envisages that about 40 per cent of all Space Shuttle flights from 1980 to 1991 will be missions using Spacelab.

The crews of the Orbiter could consist of up to seven people—the commander, pilot and mission specialist, and up to four payload specialists, who could be employees of whoever was paying for the individual mission, and who would operate the specific payload equipment involved.

The whole concept of the Space Shuttle is so vast that the best idea of its scale can be gained from the fact that the combined Booster and Orbiter vehicle will be as large as the present-day European A-300 Airbus.

The U.S. aim with the Space Shuttle is to make it available to all free-world users who can afford to pay the costs of an individual mission. No figure has been put on this as yet, but it is likely initially to be expensive, since the U.S. can be expected to want to recoup from such rentals a good deal of its original outlays on the overall venture. Since any mission could run up to 30 days, the cost per mission could amount to millions of dollars. For this reason, it seems likely that the conventional rocket launching of simple satellites will be retained for some time, at least until the Space Shuttle is able to demonstrate that it really can reduce the cost per pound of payload deposited in Space.

But there is the possibility that the U.S., under pressure of demand from its own users, and perhaps also for political reasons, will not be able to make the Shuttle as freely available to others as it now suggests it intends to do.

For these reasons, the European Space Agency on this side of the Atlantic is developing its own conventional rocket launcher system for putting unmanned satellites and other payloads into space, the Ariane, which will be launched from the Equatorial launching base in Guyana, owned by France which is a member of the ESA. The Guyana site is now being extensively refurbished for the Ariane, and it is expected that the first test-launch of this vehicle will take place around 1980.

BO105



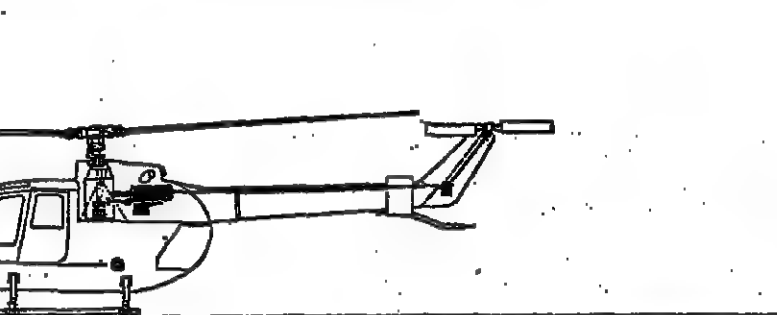
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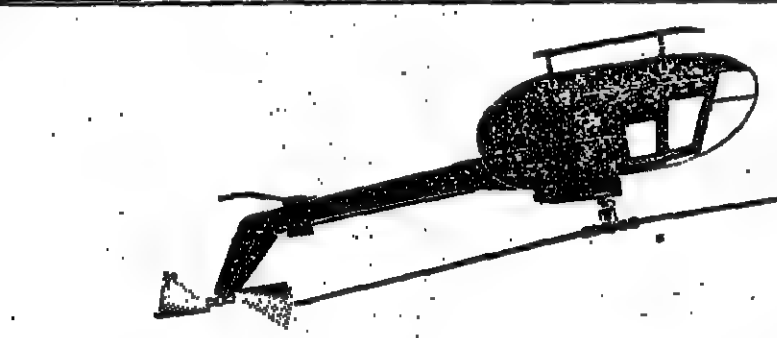
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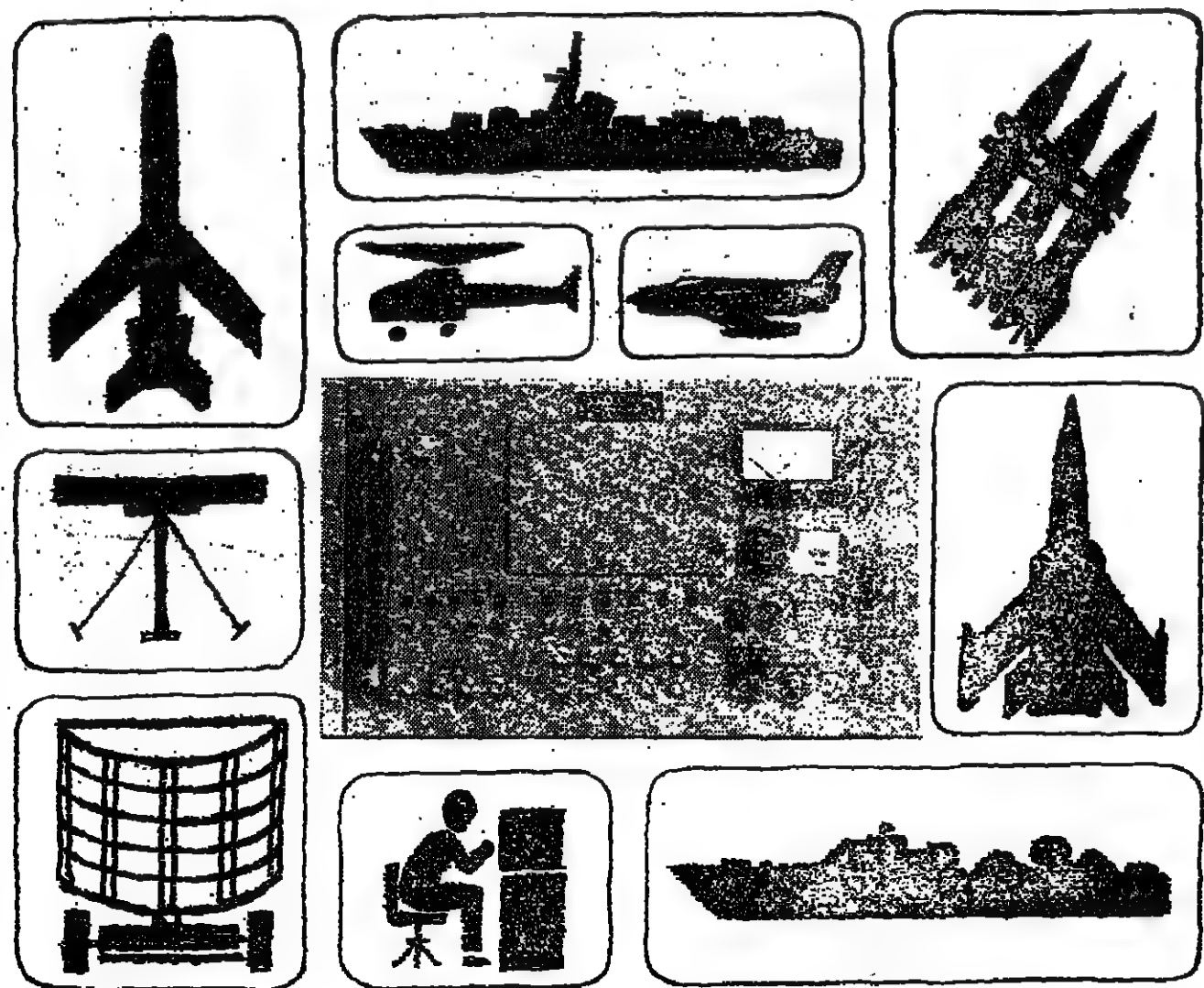
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Cargo

CONTINUED FROM PREVIOUS PAGE

It is this, perhaps more than any other feature, that makes the BA scheme of such consequence for, by applying the same rate to all types of commodities shipped under contract, the airline is virtually introducing what is known in industry jargon as a "freight all-kinds" (F.A.K.) rate, and thereby abolishing at a stroke the thousands of special commodity rates which form the backbone of the IATA rate structure and are the bane of forwarders and shippers alike. For years forwarders and shippers have been pleading with the IATA carriers to substitute commodity rates with a F.A.K. rate, and although some of the bigger airlines have been in favour of it, attempts to reach agreement on the issue have always been rejected when the unanimous decision has been sought at successive IATA cargo rates conferences.

The schemes will operate only on services from the U.K. to points in the U.S. The airline has selected the North Atlantic route as the testing ground for

two reasons—first, because more cargo traffic moves on the route than on any other, and secondly, because at the present time an "open rate" situation is in existence on the route and this effectively enables airlines operating on it to set their own rates, subject only to the approval of their own governments. In the case of the North Atlantic route, however, the U.S. Civil Aeronautics Board (CAB) insists on being consulted when rate changes are proposed, regardless of whether or not an open rate prevails.

The U.K. Civil Aviation Authority (CAA) has already given its approval for British Airways to go ahead and put its contract rates into effect, which it planned to do on September 1. If the U.S. Civil Aeronautics Board rejects the rates—and considerable pressure was being exerted upon it to do so by the four American carriers operating on the route, Seaboard, Pan Am, TWA and National—then a delicate situation could arise.

In the face of a CAB rejection the CAA would have to decide

to issue a directive to BA to apply the rates, or bow to the Board's objections. If it did so it would come under severe criticism from the British Shippers' Council and other trade organisations as well as from the majority of the U.K.'s air forwarders, most of whom have already signed letters of intent agreeing to enter into contracts with the airline as soon as its rates come into effect.

But whatever the outcome on the North Atlantic, now that British Airways has shown its hand it seems clear that the airline will seek to introduce contract rates on other routes. One of the first might be to Hong Kong which, being a cabotage route, is free from all government controls when it comes to rates.

Once that happens it will be only a matter of time before other airlines fall into line with the concept, and contract rates will become the order of the day on all the air routes of the world.

Peter Hering

M.D.

AEROSPACE VIII

Equipment suppliers kept busy

THOUGH the past year or so brought a decline in the fortunes of many of the air transport organisations as a result of world recession, a number of secondary though still important factors have kept most of the supporting industries on their toes. These factors derive mainly from the constant search for increased safety, closer attention to environmental effects, better economy and a trend towards unification of operational procedures within areas such as the EEC.

Pressure on supporting industries is unlikely to diminish, however, as their current projects come to fruition since—even disregarding the military market—something like 18,000 machines will be added to the aircraft population within the Common Market countries alone over the next ten years. Existing overcrowded or inadequate facilities will clearly become more overcrowded or inadequate and there will be growing pressure on the civil aviation authorities all over Europe for improvements in traffic control, radar surveillance and so on, apart from the pressing need to provide an all-round improvement in the power and capabilities of the on-board equipment of the light aircraft.

Of the latter, according to Frost and Sullivan, some 13,700 new units will appear in European skies between now and 1986.

During the same period, the European airlines will add no more than around 190 large transports to their fleets.

That is not to say that the work being carried out, for instance, Category II/IIIA "blind" landing by British Airways in conjunction with RAE and Smiths Industries, is of little importance insofar as smaller aircraft are concerned. But this, like airborne collision avoidance systems, is pioneering work and although blind landing paid off handsomely for the European Division of British Airways last year, particularly in November, when Tridents

were practically the only aircraft able to operate into appropriately equipped airports for several days at a stretch, it is going to take a great deal of time, sophisticated electronic engineering and endless international argument before the smaller transports, let alone the light plane, are equipped with the necessary black boxes for landing in poor visibility.

Nevertheless, there is a great deal of activity in improved, though still simple, landing systems for fitting to light aircraft and helicopters, the Philips organisation being one of the main contenders in this area. Growing interest is being experienced for small weather radars with ranges of around 200 nm, particularly now that the use of digital computer techniques is providing a clearer display of conditions ahead than hitherto possible.

But all the foregoing applies to aircraft in flight and, as Constance Babington Smith of buzz-bomb fame pointed out in her biography of Amy Johnson, "the whole art of flying is to come down to land again." And one might add: "... after having got off safely."

Testing

As in blind landing, Britain has taken a world lead in the rapid and advanced testing of aircraft tyres, wheels, and complete undercarriage and braking systems. Dunlop's Aviation Division is operating a unique high-speed dynamometer able to cope with applied tyre loads of up to 100,000 lbs and simulate take-off accelerations from rest to as much as 335 mph.

Installed at Fort Dunlop, this computerised unit can simulate aircraft inertia and perform any cycle of tests with tyre assemblies running at varying angles of steer, camber, or both. The forces working on the tyre in three planes are read off immediately and displayed and recorded through the attached computer.

It is interesting to record that, in this instance, as in the

case of the Concorde long-term fatigue testing rig whose complex computer control programmes were developed by CAP in Britain, more advanced use is being made of the power of electronic data processing to solve difficult industrial problems than anywhere else, despite the prodigious application of computers in the U.S. Space programmes.

Apart from the mechanical testing of tyres and landing gear components, Dunlop development teams have had to get themselves involved in a great deal of basic or near-basic work on the heat-treatment and sintering of metals, vacuum processing of alloys and the investigation and application of new materials, of which the Concorde's carbon brake is just one example. Indeed, a company able to cope with such a difficult material as beryllium and turn this extremely light but particularly intractable metal into reliable brake components for Trident and Concorde has already solved some of the most difficult problems that the modern metallurgist could be called on to tackle.

To play an international role in this particularly exacting industry a company not only has to spend heavily on research and development, but make an inspired choice of subjects for major programmes. Dunlop's international clients include McDonnell-Douglas, Aerospatiale, Dassault, de Havilland, Dornier, Fokker, Fiat, Kawasaki and Saab, among others.

Much has been written over the past ten years on the need to make the pilot's role less complex while simplifying the actual control device layout and making it less vulnerable to damage or failures.

It has fallen to another British company, Marconi-Elliott Avionic Systems, to score a world first in controlling an aircraft by means of highly automated equipment based on a series of tiny computers. In this, all the information flowing between flight deck and control surfaces is in the form of a

stream of binary coded impulses rather than a varying potential as hitherto.

The problem of complete electrical isolation of the various components of the control network has been given a particularly neat solution which consists in turning the electrical pulses into flashes of light which are carried from flight deck to controls and vice versa along "light pipes," bundles of continuous optical fibres, and turned back into electrical pulses at the receiving end.

Contracts

The aircraft for which the flight control system has been developed is the Boeing tender for the massive contracts expected to be placed by the U.S. Air Force on completion of its AMST advanced medium short take off and landing transport investigation. The Boeing machine is the YC-14 and by the time Fairbairn is under way, it should have begun to yield some information on the power lift concept it embodies to get it off the ground in 2,000 feet at 110 kt.

The Marconi equipment is expected to improve performance and handling qualities of the aircraft, sensing aircraft motions and pilot commands and handling the corresponding data streams through a treble computer system to provide automatic positioning of the control surfaces and adjustment of engine thrust in line with flight commands. It is unique in transport aircraft and though still a long way from fully automated digital control of an aeroplane, represents a major step towards transferring the routine jobs in flying to computers.

So far as the man in the street is concerned, this is probably the most important development Marconi will be showing. Alongside it are six entirely new avionics systems, five for military work and one for both civil and military operations. The latter is a ground proximity warning device which

has already been ordered by Laker and British Midland.

The military developments include new versions of the Head Up Display (HUD) equipment pioneered some ten years ago by Elliott-Automation and now developed into an ingredient of what is probably the most sophisticated weaponry by Marconi-Elliott.

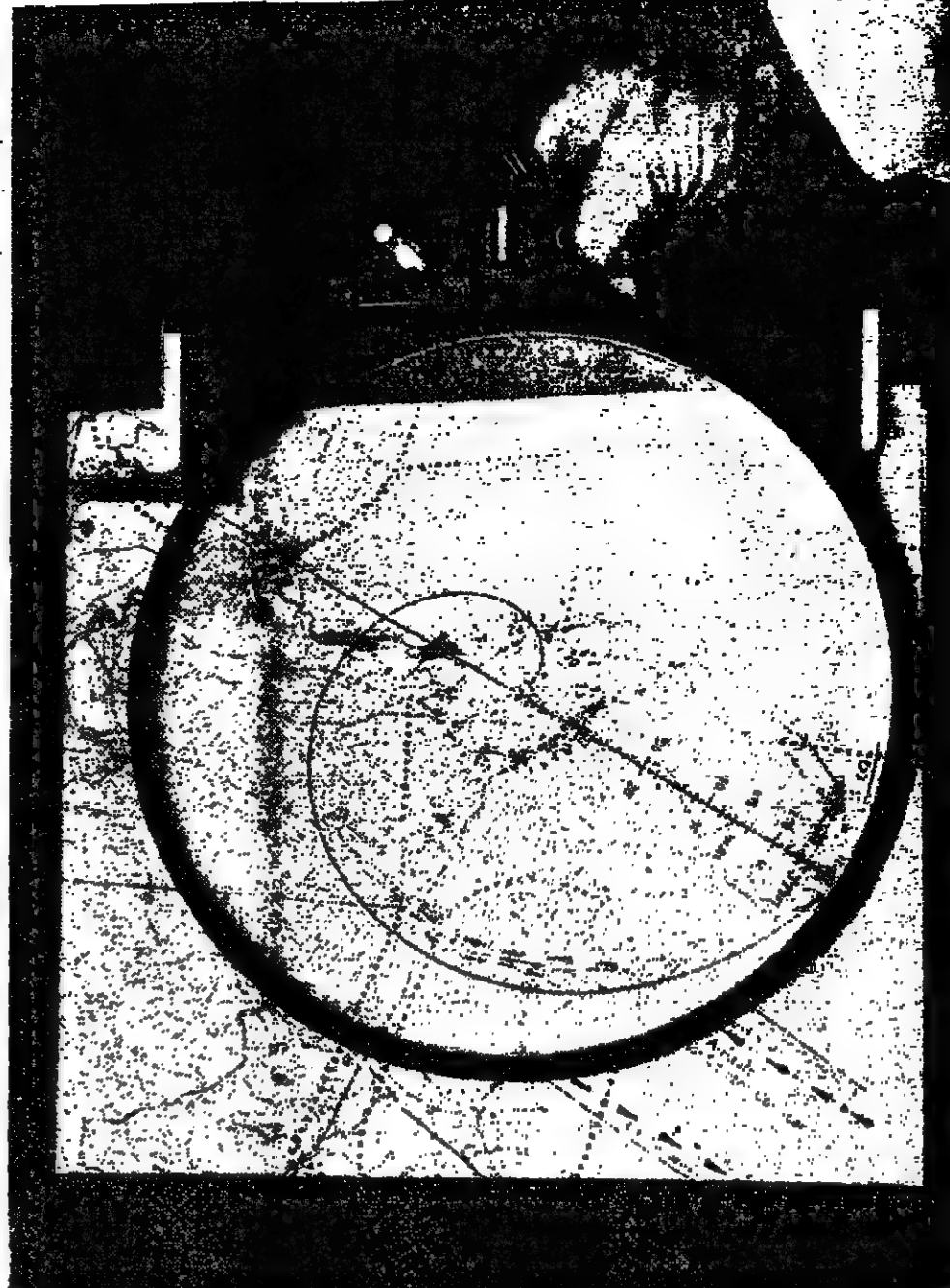
Before leaving the topic of automation—the HUD devices rely on tiny computers to automate the job of watching controls while keeping an eye on the target—work on providing digital engine controls for Concorde must be mentioned. At Fairford, Concorde 202 has been fitted with a Lucas Aerospace GPDC (for general purpose digital control unit) on one of its Olympus engines.

This equipment will control fuel flow and jet efflux nozzle at the outset of the programme. It can also handle variable intake geometry, reheat and noise abatement procedures.

Important in the acronym for these units are the letters GP: general purpose. They imply that whatever changes are made to the engine, or when the units are applied to different engines, all that has to be done is to alter the control programme in the system's electronic logic. This contrasts with the extensive physical changes that have to be made to today's mechanical controllers.

All the main components for the GPDC go into a single IATR long box and include a compact computer. Thus the rapid advances in electronic engineering of the last two years are making the avionics designer's task that much simpler. But inspired systems work is the key.

Communications in the widest sense are a further essential ingredient of flight technology and Plessey this year is stressing the development work it has done on airborne communications equipment for the world market and displaying



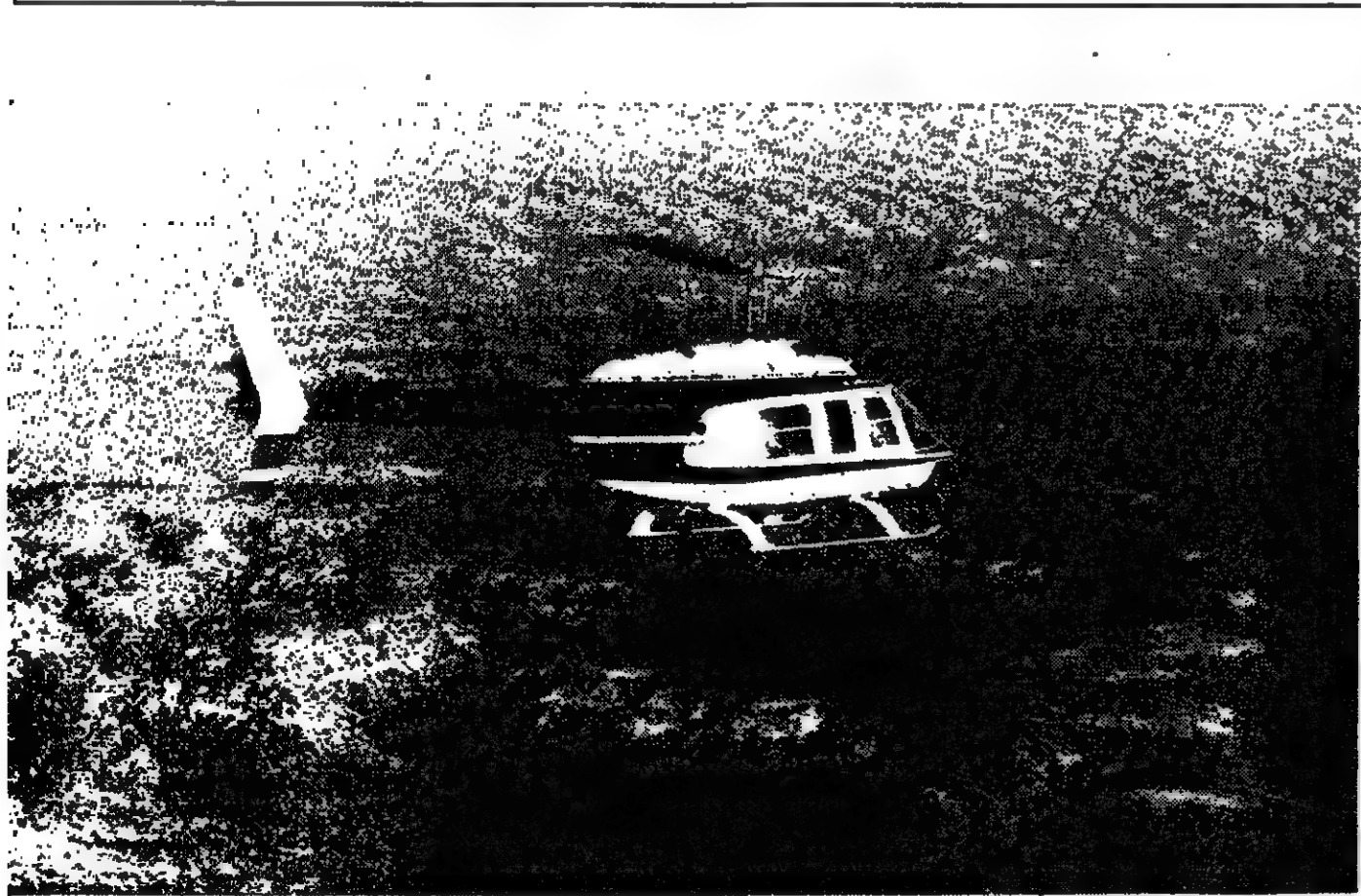
The Marconi-Elliott computerised automatic map reader (AMR). This continuously computes and displays the position of the aircraft, by dead reckoning using data inserted by the pilot.

two new transceivers, one for the DMLS now being shown publicly in its ground and airborne equipment forms for the first time. DMLS, for Doppler Microwave Landing Systems, is being assessed alongside other systems by the All Weather Operations Panel of ICAO which is intended to be used for the next several decades all over the world.

Several possible techniques were studied before the U.K. have been engaged in such authority chose doppler methods pioneering projects as the

Harrier, Tornado, Concorde the RB-211, there is a wealth of manufacturing and development experience to draw on and even when a project failed to meet the schedule, all is not lost. In instance, carbon fibre problems are understood to have been mastered at last and a new generation of engine units of immense strength to weight ratios may soon be waiting in the wings.

Ted Schoote



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U.S. industry sees fortunes revive

AFTER two years during which most sections of the U.S. aerospace industry have been beset with fears of falling profits and failure, the past 12 months have seen a sudden revival in the industry's fortunes. Indeed, some of the best known companies in both the construction of aircraft and their operation have been among the best performing shares on the U.S. stock markets.

Even Lockheed, saddled with the burden of the TriStar, and for so long the industry's lamest duck, is now beginning to emerge from the grip of its bankers and to forecast a steady improvement in its underlying business. The latest decision by British Airways to buy more TriStars will be another factor supporting the company.

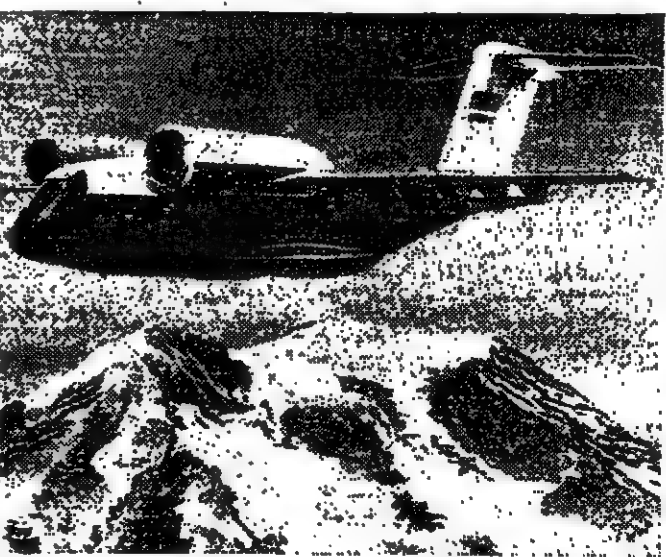
As with Lockheed and other aircraft manufacturers, one of the principal factors which explain the improving outlook has been the evidence of increasing profitability from military contracts.

Military spending accounts for around 80 per cent. of the U.S. aerospace industry's output and it was the decline in this spending which contributed so much to the industry's difficulties. With political concern about the U.S. defence capability growing and new programmes approaching production, defence spending is forecast to increase—and with it the profits of the manufacturers.

Just how firmly based this recovery in military outlays will prove cannot be confidently predicted and some projected developments, notably the new B-1 bomber which could prove to be the most costly military programme in history, has yet to be finally approved.

There are indications that its approval could hinge on the outcome of the November presidential election. Certainly Democrat Presidential candidate Jimmy Carter has indicated that he will take a close look at the \$21bn. programme.

Irrespective of the final decision on the B-1, defence spending on aerospace is destined to rise, with companies like General Dynamics, which is building the F-16, scheduled to share in the profitability of the new programmes.



The YC-14, the short takeoff and landing aircraft being developed by Boeing for the U.S. Air Force's advanced medium STOL transport programme. The aircraft made its maiden flight recently.

One problem, however, is that while there are new programmes around it is generally believed that there are not enough of them to ensure that the industry's capacity is fully utilised. Thus there are forecasts that irrespective of the increase in military spending, the military side of the industry will have to contract.

Widespread

There is fairly widespread agreement too that commercial aircraft construction will not increase rapidly enough to fill the gap. It is abundantly clear, and has been for some time, that aircraft manufacturers were not ready to fund the development of the next generation of civil aircraft themselves.

Costs are too high, and with the recent experience of demand for new aircraft falling far short of forecasts, they have become wary. Thus McDonnell-Douglas and Boeing, for example, have made it clear that international co-operation with manufacturers in other countries will be needed. McDonnell-Douglas appears to be close to a co-opera-

tion agreement with French aerospace interests, among others, and Boeing with the Japanese, although it is still far from clear that final agreements can be reached. Political factors are that much more influential when international co-operation is required.

Beyond this, however, the question remains as to just what sort of market there is for new aircraft and perhaps more crucially how the airlines in private hands are to pay for them. Most forecasts indicate that the principal market is in short-to-medium range wide-bodied jets and this is the market the manufacturers are aiming at.

By the end of the decade demand for these types is expected to materialise but meantime the private airlines have somehow got to get their operations on to a sound enough footing to be able to finance the new equipment.

In the wake of the Arab oil embargo and the rise in oil (and jet fuel) prices, the years 1974-75 were two of the worst in the U.S. aviation industry's history. In 1975 the industry lost over \$100m. as costs rose and passenger demand slumped.

The first six months have seen a phenomenal recovery in the industry's profitability, and Wall Street analysts now see the line profits overall this year, over \$250m.

Vigorous cost-saving programmes, stabilisation of costs and higher fares—among the factors which have contributed to the recovery—needs to be noted, however, while the airlines as a group are profitable there are notable exceptions among individual airlines. Thus Pan American and TWA have both cut their losses significantly in the first half of the year; they are still both lost money.

Argument

Increasingly the issue of fuel is seen in these circumstances as crucial to the industry's development. The argument is that if the airlines are to generate internally the cash to finance new capacity (and the profits which will enable them to tap investors for capital) they will need to have a flexible price control.

So far this year there have been indications that the Civil Aeronautics Board is allowing prices to rise. But the rule this regulatory agency is its an issue—whether, for example, the industry should be deregulated, and if so whether it would lead to such severe competition that airlines would be driven out of business or, alternatively, to politically unacceptable price increases.

This uncertainty continues to cloud the outlook for the airlines. There are those who believe, however, that while there are some major carriers who are weak financially and relatively unprofitable, the industry's regulators will not impose too strict a programme of price restraint and the industry's more profitable carriers at least will be able to build up resources to finance re-equipment. How the weaker airlines will cope with the problem of financing new aircraft remains an open question.

Stewart Fleming

AEROSPACE IX

Renewed growth for the airlines

OVER THE past few months, all the indications have been strengthening that the recession which began with the fuel crisis in the winter of 1973 is now over, and that world-wide air transport is picking up again. So far, the improvement appears to be stronger on the long-haul routes, with some of the regional short to medium-haul routes, such as in Western Europe, responding at a slower rate.

This improvement, provided it is sustained (and so far there is no reason to believe that it will not be), is likely to be welcome to the airlines for a variety of reasons, although it will also bring some major problems. In the first place, the renewed expansion is likely to be at a slower rate than that of 12 to 15 per cent, a year, historically experienced in the mid to late 1960s.

Recent studies prepared by the International Air Transport Association (IATA), covering its 111 member airlines, have suggested that world-wide between now and 1981 the industry can expect an average annual growth rate of about 8 per cent, although the pace of economic recovery, and hence of air transport expansion, can be expected to vary widely. The biggest rate of growth is expected between Europe and the Middle East (14.3 per cent a year), with Europe, and the North Atlantic, both already mature markets, expanding only at about 5.8 per cent a year.

Secondly, this expansion will go some considerable way towards easing much of the over-capacity problem that has bedevilled the industry for the past few years, stemming from the sudden slackening of the growth rate in 1973-74 as a result of the economic recession, combined with the excessive inflow of new aircraft to the world's commercial airline fleets in the earlier part of this decade.

The airlines have tended to cope with this over-capacity in a variety of ways, such as of expansion, there are many straight cancellations of flight

frequencies; by new inter-airline agreements to curb the number of seats on particular routes, such as the North Atlantic, by agreeing on "route swaps" and by grounding and sometimes selling surplus aircraft. Even so, on many routes, and again notably the North Atlantic, an over-capacity situation has persisted, and even with the welcome return to a period of steady expansion it seems likely that many of the efforts to curb this problem will have to be sustained well into the period immediately ahead. Many airlines have still not digested fully the substantial volume of additional seats that became available to them with the delivery of wide-body aircraft, such as TriStars, DC-10s, Jumbo jets and A-300 Airbuses in the period immediately preceding, and even during, the period of recession. At the same time, many airlines are still committed to completing large orders placed in the era of high traffic growth before the recession began.

Reluctance

As a result, there is still a marked reluctance on the part of many major airlines to place orders for new equipment. This in turn has been and is causing the world's major aerospace manufacturers in Europe and North America some considerable difficulties in maintaining production lines at economic, let alone profitable, rates. It may be some time, perhaps as much as a year, before some of the major airlines in Europe and North America are convinced that the recession is really over, that their balance sheets are improving satisfactorily, and that their over-capacity situation is coming fully under control.

Only when that combination of factors occurs will they be likely seriously to consider the purchasing of new equipment. For while the situation in air transport may be moving back into a more favourable period

is doubtful, for example, whether the scheduled airlines are likely to gain much financial benefit from this expansion, at least for some time to come, and certainly not until they have been able to get the rapid rise in costs of all kinds under control.

The IATA, in a financial review recently published, stressed that 1975 was another disappointing year for the world air transport industry, with the continuing recession combining with severe cost inflation to produce "a totally inadequate" financial result. Revenues of the IATA members in 1975 reached the record level of \$30bn. (out of \$37bn. for all the world's airlines), but total expenditures exceeded revenues to produce an operating loss of 1.3 per cent, or about \$400m. net on their total operations.

"This result is totally inadequate for future development of the industry," says the IATA, "but would have been worse without the subsidies and taxation concessions granted by many national administrations." The IATA Cost Committee estimates that for IATA scheduled international services alone an additional 14 per cent increase in revenues (or about \$1.55bn.) was required in 1975 to provide funds to cover interest and other financial expenses, full taxation liabilities, and a fair return to shareholders.

The steep rises in costs of all kinds, but especially labour, air navigation and airport user charges, and in some parts of the world fuel prices also, have continued into 1976. While to some extent these increases will have been mitigated by the increased revenues earned on the rising volume of traffic, it remains doubtful whether the overall result for 1976, when it finally becomes available, will show any significant improvement.

It is against this background of financial uncertainty, however, that the world's airlines will have to face all of the problems that the renewed expansion of traffic will bring.

Contrasting

This lack of a satisfactory, uniform global system of government regulation for air transport is one of the most potent forces working against the development of a healthy, profitable air transport industry. In virtually every country of the world, a different system of air transport regulation prevails, with different governments holding different, and often sharply contrasting, views on how their particular air transport systems should be run.

Mr. Knut Hammarskjöld, the director-general of IATA, has been tirelessly campaigning for some uniformity of regulation in world air transport affairs, and it is to be hoped that, much greater attention will be paid by governments to this need for standardisation of regulatory control. This would not only make the task of the world airline industry much easier, but also go a long way towards achieving the lower cost basis upon which a cheaper fares structure can be constructed.



Artist's impression of the newest member of the Lockheed TriStar family—the Dash 500—which has been ordered by British Airways for introduction into service in 1979.

But the expansion in the period ahead will bring other problems, many of which were already evident when the recession began but which were conveniently swept out of sight under the carpet when the urgent need to deal with them disappeared. Among these are noise, and new airports.

Throughout the world, there is now a growing emphasis on the need for a new generation of quieter aircraft to meet the increasingly stringent noise regulations that governments are being forced to implement by noise-conscious communities around airports. During the period of comparative slack traffic development of the past three years, the problem of noise has not been ignored—indeed, in some countries such as the U.S., it has been tackled with considerable vigour—but the air transport industry can expect the problem to recur in an even more determined fashion now that the public at large can see that air transport itself is resurgent.

In turn, this will bring increased pressures on the airlines to phase out the older and noisier (and, incidentally, also

fuel-inefficient) airliners, in much before mid to late 1977 at the earliest, although the present comparative trickle of airline orders is likely to be maintained until then.

Paying for this new generation of aeroplanes will provide another major headache for the airlines. It has been estimated that they will need some \$48bn. of new money to meet their re-equipment needs up to 1985—and there are few signs at present that the traditional lenders, the major banks and insurance companies, are prepared to finance this scale of re-equipment until the financial situation of the industry has improved.

Since new equipment is essential to an improvement in financial health, there is likely to be a hiatus over the next year or so while not only the manufacturers seek to satisfy the airlines as to the long-term noise, fuel-efficiency and economic viability of their new designs, but also while the airlines satisfy their lenders that the industry is once again firmly on a rising trend of prosperity.

For these reasons, the major "re-equipment tide" often forecast is not likely to flow

industry moves more confidently into the period of renewed growth, many cherished airport schemes which have been gathering dust will have to be brought out again and studied anew. Thus, it is possible to predict that the expansion in the air, with all that it entails in new capital financing, is likely to be matched by an equally vigorous expansion in facilities on the ground, also calling for substantial injections of cash.

Grandiose

So far as the airport situation is concerned, it seems clear that in many parts of the world a serious situation will arise as existing airports, deemed adequate for the early 1970s, become inadequate for the 1980s and 1990s. In some countries, grandiose airport plans that were under way or mooted in the early 1970s were axed when the recession struck, and some governments clearly have been hoping that they need not be revived.

The fact is, however, that although at many airports there may be adequate runway capacity (especially if the trend towards the use of bigger wide-body aircraft, each capable of carrying more passengers, is maintained), there will be a serious inadequacy of terminal capacity, resulting in congested passenger handling facilities on a rising trend. Thus, as the recession fades, and the air transport

For what has been happening over the past three years is that air transport, far from being dead, has been quiescent. Aviation observers throughout the world have been repeatedly stressing that a period of renewed growth, with its accompanying demands on financial and other resources, was bound to emerge sooner or later, and that preparations should be made for it while the pressures were slack. A new boom is on the way, and while it is to be welcomed, in many parts of the world it remains to be seen if the air transport system is ready for it.

M.D.

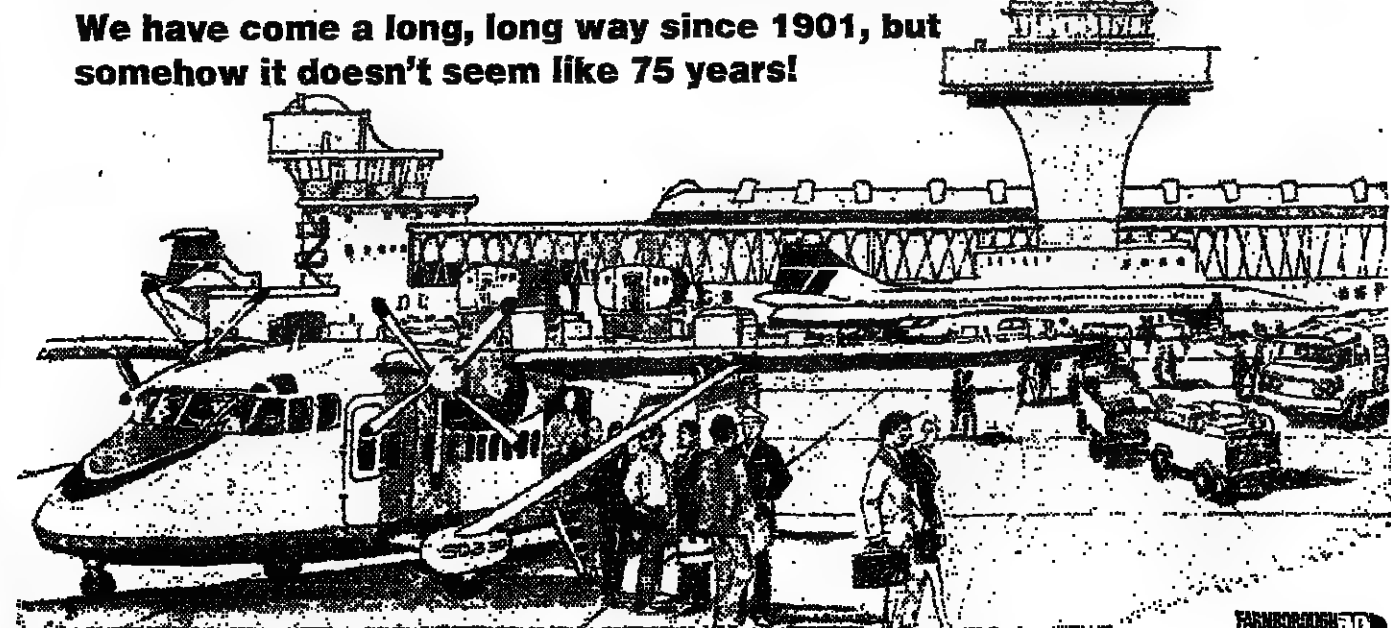
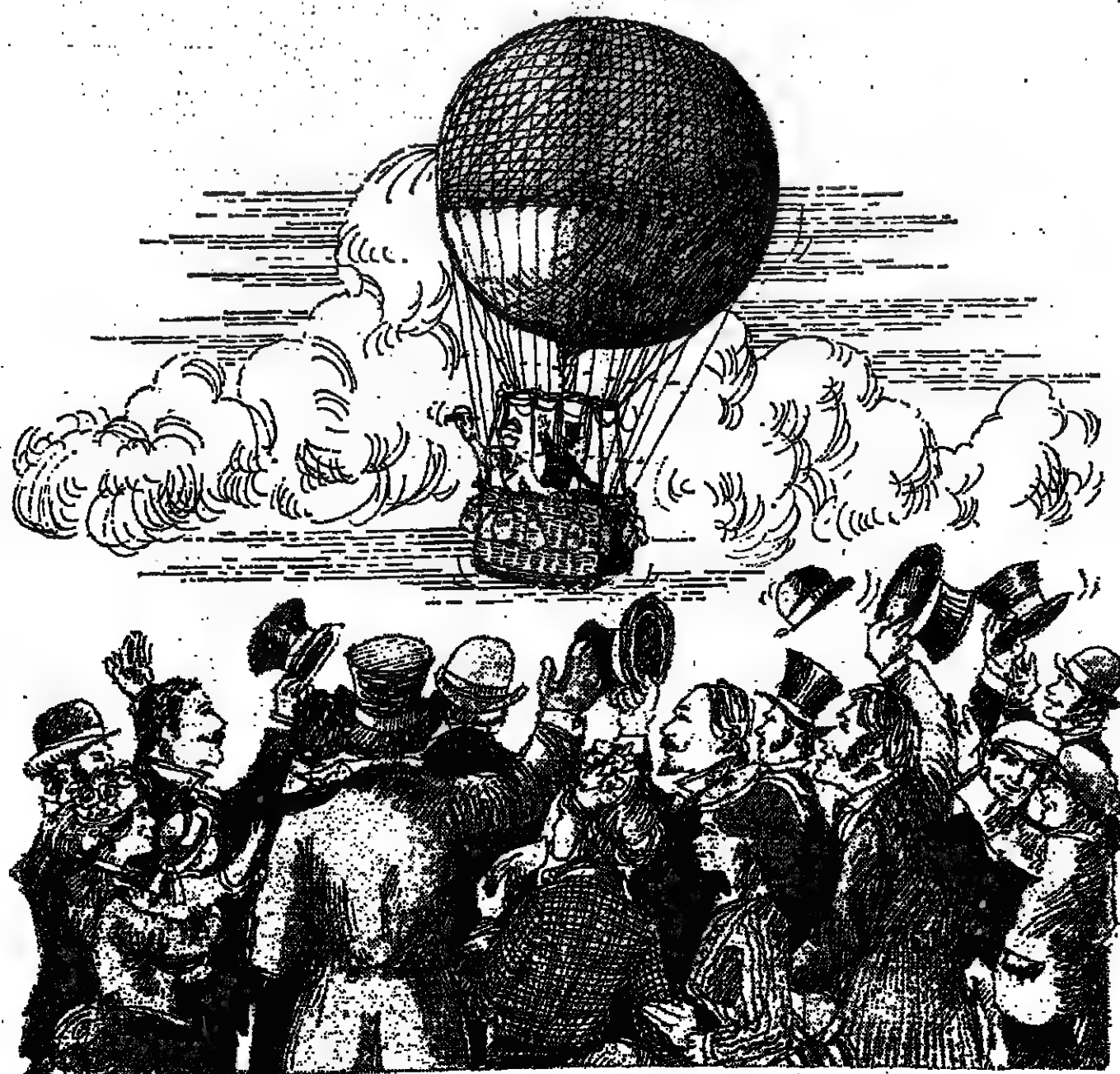
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AEROSPACE X

RAF in tight trim

THE PRIMARY concern of the RAF today is to ensure that despite the substantial cuts in its budget stemming from the Defence Review of 1974 and the subsequent Government's public expenditure reviews of 1975 and this year, it can continue to provide a first-class fighting force capable of fulfilling all the commitments imposed upon it by U.K. defence policy.

The task is not an easy one. The latest financial cuts, coming after a long period of persistent whittling away of the RAF's budget, and hence also its manpower and aircraft strength, have already resulted in substantial changes in the size and composition of the fixed-wing transport force, reductions in the size of the Nimrod maritime reconnaissance force and the future support helicopter force, and a reduction of up to one third in planned rate of deliveries of the Tornado Multi-Role Combat Aircraft (MRCA).

The air transport force has now been reduced by about half, and all Comets and Britannias withdrawn from service. The size of the helicopter support force has been reduced, partly by disbanding the Wessex squadron in Singapore, and further reductions in the support helicopters and the maritime force are related to continuing commitments in the Mediterranean.

In addition to these changes, further detailed studies of the long-term air transport task, as a result of the need to save money and also because of changing commitments, have shown that the long-term overall size of the RAF transport force remains adequate, but that a more economic use of resources can be achieved by increasing the numbers of VC-10s and Hercules aircraft in the front-line, and disbanding the Belfast force.

At the same time, considerable savings are being found in the support area, involving reductions in spares and engineering support, communications and radars, and works expenditure. Also, in continuation of the policy of reducing support costs to the minimum, the plans for the merger of Training and Support Commands

will be completed during 1977. When this merger is completed, the RAF Command structure in the U.K. will have been reduced in the course of a decade from eight Commands to two, with substantial savings in personnel and administrative costs, while the size of the RAF overall will have been reduced from a total of 113,000 personnel at April 1, 1970, to around 87,000 at April 1, 1977.

It has been made clear to the Government in the strongest terms that defence spending overall has now virtually been pared to the bone, and that any further reductions for economic or political purposes can only be achieved at the expense of cuts in commitments, including those to Nato.

That this possibility of further spending cuts is fundamentally undesirable has been made plain repeatedly by the former Chief of the Air Staff, Sir Andrew Humphrey (who is now the Chief of the Defence Staff, and who, therefore, can be expected to reiterate this theme in future on behalf of all three armed services). Sir Andrew has drawn attention to the continued substantial build-up of Soviet conventional forces, including air-power, and especially in that most important of theatres, the European Central Region of NATO.

Damage

Sir Andrew has said that the Soviet Union each year is building 1,800 military aircraft—enough to replace our whole front line every six months or so—of which over half are high-performance combat aircraft. "Russia is spending more on military research and development than the whole of the Western world put together. So we must expect in the future to be faced not only with forces of increasing strength and of increasing capability, but also almost probably by some alarming technological achievements. . . . We are just at the beginning of an era of extremely accurate air-delivered weapons, some tens of aircraft to do the same damage that would have previously required 1,000 air-

craft. It is of the greatest importance that we put a lot of effort into strengthening our air defence."

While the battle to prevent further cuts in spending continues, however, on the equipment side some substantial progress is being made in developing new aircraft for the future. The production contracts for the Anglo-West German-Italian Tornado Multi-Role Combat Aircraft have now been signed. Out of an ultimate total of 809 aircraft for those three countries, the RAF is destined to get 385, of which 165 will be the specialised Air Defence Variant for the air defence of Great Britain, while the remainder will be of the basic version for a wide range of roles, including battlefield support and air superiority, tactical strike by both land and sea, and interdiction (the destruction of the enemies' support installations behind the lines).

Each Tornado will cost around £5.5m. in the basic version and £8.5m. in the Air Defence Variant. Work on the development programme has been under way for some years, with eight of the nine prototypes now flying, while six pre-production aircraft are also being built.

The Tornado is a twin-engine, two-seat, supersonic swing-wing combat aircraft, and in the RAF it will progressively replace five aircraft types—the ageing Canberra, Buccaneer, Vulcan bombers and Lightning fighters, and supplement and eventually also replace the Phantom combat aircraft. The RAF sees the Tornado fulfilling the bulk of its front-line combat needs through to the 1980s.

At the same time, work is now gathering momentum of the eventual replacement of the Jaguar jet strike-trainer and the Harrier vertical take-off fighter. Currently, the aim is to try to find one common type that can replace both these aircraft in the close-support and battlefield air superiority roles. To this end, a combined Air Staff Target paper has been written, called AST 403, and this is now being studied in the aerospace industry to enable the military aircraft manufacturers to come up with their preliminary ideas

as to how the Air Staff's needs can be met. As yet, AST 403 is little more than a concept—a list of requirements as to flying and fighting performance capabilities—out of which the aerospace industry can shape a possible aeroplane.

The discussions about AST 403 are likely to continue for many months. The possibility of international collaboration on this programme has already been raised since it is likely that other members of NATO will also have a requirement for a similar aeroplane in the mid to late 1980s, in which case, a joint development and production venture could become feasible.

Programme

The preliminary RAF requirement would appear to be not less than 300 aeroplanes (replacing 200 Jaguars and 111 Harriers), while the French Air Force, which also has 200 Jaguars, may need a similar number of replacements for that aircraft. Even discounting any possible West German or Italian requirements, therefore, a major programme for over 600 aircraft appears to be shaping up, and it seems likely that the eventual Jaguar-Harrier replacement could become a military programme of major significance in NATO, rivaling that of the Tornado itself.

Also looking ahead, the RAF is expected to get this year the first of its new generation of light combat trainer aircraft, the Hawker Siddeley Hawk, of which it has 175 on order. This jet trainer (which is also being offered to overseas air forces both as a trainer and a possible light combat aircraft), will be used to train pilots to fly fast jets, and will replace the ageing Gnats and Hunters now in service.

A major Nato study is also now in progress to find what is called an "Airborne Warning and Control System (AWACS)" aircraft, which would be always airborne in sufficient numbers to enable early warning to be given of enemy attack along the entire frontier of Nato from the North Cape of Norway to the Eastern Mediterranean. This is a formidable requirement, requiring a highly specialised and therefore expensive aeroplane.

Two possibilities exist. One is to buy the Boeing E-3A aircraft which has already been developed for this purpose and which is now on order for the U.S. Air Force. A Nato procurement of about 32 aircraft, worth in all more than \$4bn. (over £2.3bn.), has been under discussion for some time, but although some countries, such

as West Germany, are believed to favour Boeing, no decision seems likely before the latter part of this year.

A second possibility would be to modify the existing RAF Hawker Siddeley Nimrod maritime patrol aircraft for the AWACS task. This procurement decision is of considerable importance to the RAF, since it would be required to operate the U.K. share of the Nato force, while it also needs an aircraft to replace its own ageing Shackleton Airborne Early Warning aircraft.

While these new aircraft are either under development or being mooted, a continued programme of improvements to existing types is under way. These include modifications to the Nimrod maritime reconnaissance aircraft to enhance its capability of detecting, classify-



A Jaguar of the RAF photographic reconnaissance squadrons in service with Nato.

ing and attacking submarines, and of detecting and shadowing surface vessels; improvements to the Buccaneer fighter, the fit-

ting of laser-ranging and marked-target seeking equipment to both the Harrier and Jaguar, which will greatly improve their target acquisition capabilities; and accuracy of weapons delivery; the conversion of the Victor Mark 2 aircraft to the air-to-air refuelling role; and a programme to extend the life of the Hercules transport by replacing the centre section of the wing.

In addition, a major programme of new guided weapons development is in progress. This includes a new medium air-to-air missile, the XJ-321 Sky Flash, based on the American Sparrow missile, which it will eventually succeed in RAF service. Initial development work

has begun on a number of air-to-surface weapons, designed to increase the effectiveness of strike/attack aircraft in the 1980s and 1990s. Projects under consideration include weapons for attacking ships, armour and defence installations such as surface-to-air missile sites, and airfield runways.

In all, therefore, while the RAF has already borne its fair share of the cuts in defence spending, and has been substantially reduced in size, both in terms of manpower and aircraft, it remains a tightly knit fighting force, leaner and tougher than ever before, with exceptionally high morale, which the introduction of the prospective new generation of military aircraft can only serve to improve further.

M.D.

Big market for helicopters

As with many other aspects of the world aviation scene, in helicopters one era has come to an end, and a new one is emerging.

Throughout the main helicopter manufacturing countries of the Western world—primarily the U.S., U.K., France, Italy and West Germany—the emphasis is on finding new designs that will meet the requirements of both civil and military customers through the 1980s and beyond, with an increasing emphasis on the civil side of the business.

The market is also now characterised by an intensification of competition, with the American manufacturers—in particular Bell, Boeing Vertol, Hughes, Kaman, Sikorsky—determined to capture a bigger share of the emerging civil markets.

Deliveries

These include the Boeing Vertol twin-engine 20-seat YUH-61A and the Sikorsky YUH-60A 20-28 passenger helicopters in the UTAS programme, with civil versions already envisaged; the Boeing Vertol 179 and Sikorsky S-78; and the Bell YAH-43 and Hughes YAH-64 twin-engine aircraft for the AAH programme (although so far as is known no direct civil derivatives of the latter two aircraft are envisaged at this stage). Sikorsky is offering its S-76 13-seat twin-engine civil helicopter, while Bell is now working on its Model 232 light twin-engine commercial helicopter, designed to carry six to ten people, with first deliveries of both aircraft expected in 1978.

In Europe, Aerospatiale is offering the ten-seat SA-330 Dauphin single-engine helicopter, with a twin-engine version, the SA-365, while the company is also working on the SA-350 Ecureuil, a single-engine 5-6 seat helicopter which is due for certification by the end of next

year. MBB of West Germany won for six aircraft from the Royal Netherlands Navy for search and rescue duties, with ten more at an increased weight for the anti-submarine role.

Westland says that development of the Lynx to carry increased payloads is important because of the demands made to carry more electronics by export customers without penalties in fuel capacity. The company is being kept outside the Government's plans for the nationalisation of the main aerospace companies. Group

turnover of the Westland Aircraft Group, of which Westland Helicopters is part, amounted to over £108m. in 1975-76, of which 68 per cent. came from the helicopter activities, about 8 per cent. from Hovercraft, and the remainder from environmental control and allied products, doors and other engineering items. Westland Helicopters employs about 7,250, of which group's total of 12,500, and of its output about 51 per cent. was exported in 1975-76.

Westland's main products include continued production of the three helicopters in the major Anglo-French military helicopter "package"—the light Gazelle, medium tactical transport Puma and multi-role Lynx helicopters. The order book for the Gazelle totals 721 aircraft, of which over 560 have been delivered. Westland makes about half of each Gazelle airframe by value, and it also assembles Gazelles. It makes which 32 have been ordered and about one-fifth of the value of the Puma airframes, which are sent to France for final assembly by Aerospatiale.

The Lynx, however, is Westland's current major product, with 113 on order in the naval version and 103 in the multi-role (Army) version. So far, 13 Lynx development aircraft have been built and flown. An export order has also been

placed by the Royal Netherlands Navy for search and rescue duties, with ten more at an increased weight for the anti-submarine role.

Westland says that development of the Lynx to carry increased payloads is important because of the demands made to carry more electronics by export customers without penalties in fuel capacity. The company is being kept outside the Government's plans for the nationalisation of the main aerospace companies. Group turnover of the Westland Aircraft Group, of which Westland Helicopters is part, amounted to over £108m. in 1975-76, of which 68 per cent. came from the helicopter activities, about 8 per cent. from Hovercraft, and the remainder from environmental control and allied products, doors and other engineering items. Westland Helicopters employs about 7,250, of which group's total of 12,500, and of its output about 51 per cent. was exported in 1975-76.

Dormant

Also as part of the development of the Lynx, Westland has just flown a version of the SA-331 Super Puma—a new craft with the Pratt & Whitney engine, (Canada) PT6-36 engines. This development has been undertaken in support of the civil versions of the Lynx (the Westland 606) programme which, although at this time dormant from a marketing point of view, is nonetheless continuing as a private venture in engineering development with a view to possible future civil markets.

In addition to the Lynx, Westland has the Sea King anti-submarine and search and rescue helicopter, of which 156 have been ordered, with 128 delivered so far. Derivatives of this big helicopter include the Westland Commando transport model, of which 32 have been ordered and 28 delivered, including several to Egypt.

As with civil fixed-wing aircraft and engines, helicopters have been deeply involved in international collaboration over recent years, following the 1967 Anglo-French agreement of the development of the Gazelle light helicopter, the Puma tactical transport aircraft and the multi-role Lynx. In 1974, the asso-

ciation between Westland and Aerospatiale of France resulted in the signing of a business agreement which defined the rules for future collaboration on a commercial basis rather than on government-initiated programmes.

In 1975 a memorandum of understanding was signed by the two companies, and by Messerschmitt-Bölkow-Humboldt of Germany and Agusta in Italy, as the other two major European helicopter manufacturers, defining the basis for a four-country, four-company industrial collaboration in helicopter research, design, development and manufacture, both the 1974 and 1975 agreements have already produced results. Westland is in collaboration with

Aerospatiale in the design of the Lynx, Westland has major items for the latter's just flown a version of the SA-331 Super Puma—a new craft with the Pratt & Whitney engine, (Canada) PT6-36 engines. This development has been undertaken in support of the civil versions of the Lynx (the Westland 606) programme which, although at this time dormant from a marketing point of view, is nonetheless continuing as a private venture in engineering development with a view to possible future civil markets.

So far as the four-country agreement is concerned, an official body has been set up on the government side to try to unify helicopter operational requirements for the 1980s. This is being supported by government industry joint working groups to consider design studies and reviews of helicopter engineering developments.

It is hoped, therefore, that as a result of these activities some four-country designs of helicopter may emerge in the not too distant future to meet the civil and military needs of the 1980s and beyond. For helicopters, as in other types of aircraft, the competition from the major U.S. helicopter manufacturers is formidable, and the European needs of the future as a means of boosting their production lines.

M.D.

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Lockheed to build a new long-range TriStar.

After many months of evaluation, British Airways has chosen a new model of the Lockheed L-1011 TriStar for its longer routes. Called the Dash 500, it goes into service in 1979.

In making its decision, British Airways had more than two years of experience in operating a shorter-range model of TriStar. That model has not only been the world's most reliable* big jet for 35 consecutive months, it also is the quietest, as certificated by the U.S. Government.

The new model adds almost 2000 miles to the range of TriStar. It means passengers will be able to enjoy TriStar reliability and comfort on nonstop routes such as London-Los Angeles, Sydney-Hong Kong and Buenos Aires-New York. The long-range TriStar will be powered by three Rolls-Royce RB.211-524 engines, each with a thrust of 50,000 pounds.

A 6100 mile TriStar. The world's most reliable big jetliner has taken a long step forward.

The world's most reliable big jetliner.
One of the technological achievements
of the 55,000 workers at Lockheed.

*Based on airline statistics covering all big wide-body jets. The statistics, which record mechanical delays and flight cancellations, reflect the ability of TriStar to operate on schedule.

AEROSPACE XII

French co-operation is widespread

THE FRENCH Government's pation of France's European decision earlier this month to partners, it is understandable give the green light for the that the British aircraft industry development of a new medium-range airliner, the Mercure 200, playing a sub-contractor's role by the two major French aircraft manufacturers and McDonnell-Douglas of the U.S. has dispelled some of the gloom about the industry's future.

Though it poses almost as many problems as it has solved, the Mercure 200 is still on the cards after the Mercure decision.

The British are sceptical. It is pointed out in the U.K. that the Mercure 200 has much the same payload-range performance as the proposed Airbus A-300 and that in any case the French Government would probably be reluctant to finance both ventures. Strong doubts about the ability of the and European Airbus orders are also expressed in Britain about the ability of the Mercure 200 to compete against major rivals such as the 737 family planned by Boeing, which includes a medium-range model, and the 747 derivative of the short-haul Boeing 737. Dassault's claim that there is a market for 800 of the new aircraft over the next 10 years is considered to be wildly optimistic.

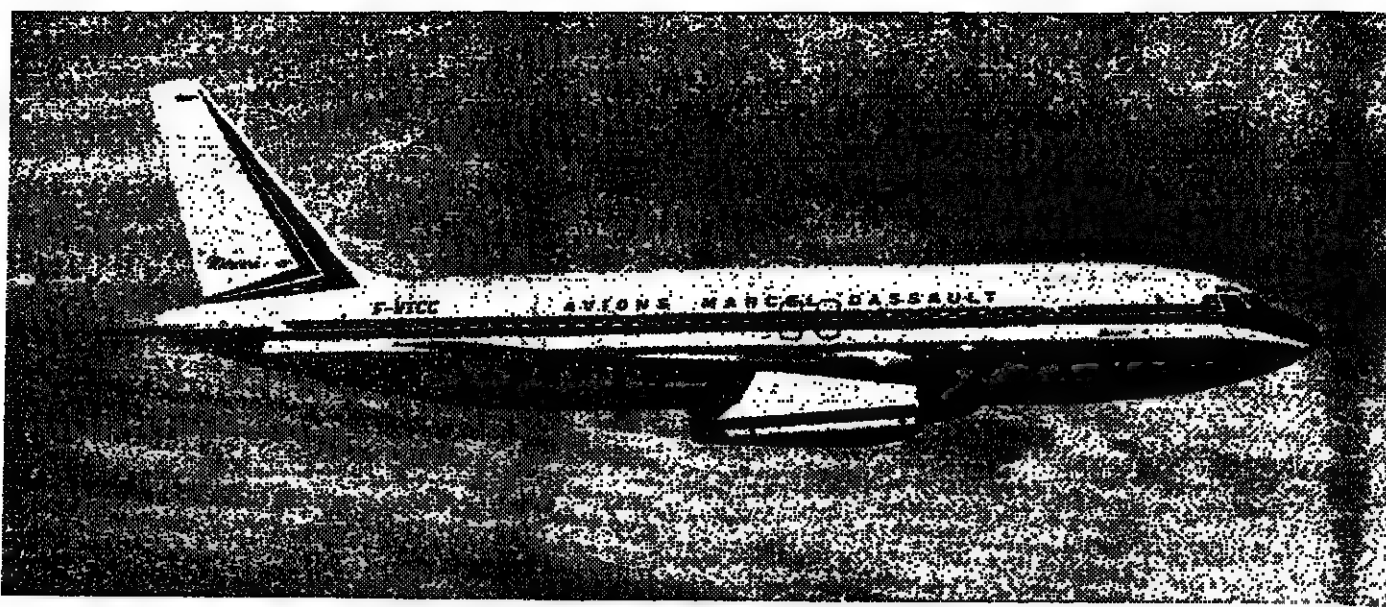
Such a boost could only be given by a major civil aircraft project and it has long been the conventional wisdom on both sides of the Channel that this was viable only in co-operation with a U.S. manufacturer in order to compete on the vital American market. The initial reaction from France's prospective European partners has admittedly been hostile, mainly because the decision was unilateral and because the announcement came before they themselves had taken any decisions. But they could hardly have been taken completely by surprise, since the project has long been the subject of negotiations within the so-called "Group of Seven", which includes the British Aircraft Corporation, Hawker-Siddeley Aviation, Messerschmitt-Bölkow-Blohm, Dornier, VFW-Fokker, Aerospatiale and Dassault-Breguet.

These negotiations, according to highly reliable sources in Paris, had even reached the stage at which the British aircraft industry was offered a 20 per cent. stake in the Mercure 200 project, which would probably mean that it would build the wings, as Hawker-Siddeley is already doing in a private capacity for the Airbus A-300. Though this would amount to half the total proposed partici-

Confident

Be that as it may, the French remain confident that Britain will come into one or other of the European projects. But they have so far kept very quiet about their future plans for the Airbus and it is difficult to say at the moment whether British fears concerning the French Government's reluctance to finance two major new projects will turn out to be justified. Certainly, further clarification of French intentions is required before the other members of the "Group of Seven" can make up their minds about their own attitude, since what has been announced so far amounts to only the bare bones of a joint venture.

As things stand, Aerospatiale, the French State-owned aircraft manufacturer, has been awarded the lion's share of 40 per cent. in the new Mercure 300 project; McDonnell-Douglas, which will build the aircraft in the U.S., 15 per cent.; and Dassault-Breguet, the privately-owned



The Dassault-Breguet Mercure 100, of which a derivative—the Mercure 200—has been proposed by the French Government as an international programme for the future.

French company, a surprisingly low 5 per cent., with the remaining 40 per cent. shared out between various European partners.

Aerospatiale, which has been obliged to give up its own plans for co-operation with Boeing, has won the consolation prize of building the airframe at its Toulouse plant. But Dassault-Breguet, the constructors of the commercially unsuccessful Mercure 100 from which the new aircraft is derived, retains the design leadership, a fact which has upset the Left-wing unions at Aerospatiale, many of whose own designers are likely to find themselves without jobs.

The engine, too, is a joint Franco-American venture. The Mercure 200, a narrow-body jet which will be capable of carrying about 180 passengers over ranges of more than 1,700 miles, will be powered by two of the new 10-tonne CFM-56 jets developed by General Electric of the U.S. and the French State-owned SNECMA engines, which are reputed for their quietness.

All this, the French Government has emphasised, is no more than a decision in principle and conditional on the negotiation of detailed contracts between the various companies

concerned. Indeed, no one is in any doubt that the hurdles which still remain to be cleared before the project materialises are considerable.

Two major problems still remain to be solved. One is finance and the other what McDonnell-Douglas intends to do about its other projects which could undermine the sales prospects of the Mercure 200.

The French Government is understood to have attached a very important condition to its own financial contribution, making it dependent on a substantial financial commitment by the American partner in the project. Some doubts have already been expressed by commentators in France about whether McDonnell-Douglas is really prepared—or able—to dig as deeply into its pockets as the French Government seems to expect. From the purely financial point of view Boeing would have been a better partner.

Secondly, the French Government appears to want the U.S. company to give an undertaking that it will not go ahead with any new aircraft which would compete on the world's markets with the European Airbus. In spite of this, the French Government is also the major partner. On the face of it, it seems highly improbable

that McDonnell-Douglas will agree to drop its own DC-X-200, a short-to-medium airliner, with-

out being given a much bigger stake than it has at present in the French-dominated project.

The difficulties which have arisen in the negotiation of a pre-arranged contract for the purchase by Belgium of more than 100 General Dynamics YF-16 military aircraft, as part of "the arms deal of the century," are a pointer to what could well happen in the case of the Mercure 200. Those negotiations have already been going on for a year and the final signing is still in sight, so it can hardly be expected that the Franco-American deal, which raises equally complicated work-shar-

ing and financial problems, will move much faster.

Nevertheless, a decision in principle on a future civilian airline project had become a matter of urgency for the French Government, whose successive annual losses—Fr.457m. (254m.) in 1975—much of which can be put down to the funds it has sunk into Concorde and Airbus.

space industry is concerned, the announcement came none too soon. True, as a whole it has not been doing too badly. Global consolidated turnover in 1975 totalled Frs.15.5bn. (about £1.7bn.), up by nearly 20 per cent. on 1974 (6 per cent. at constant exchange rates). Exports too have risen from Frs.5.3bn. to Frs.7bn. over the same period, while foreign orders were down only slightly from Frs.10.4bn. in 1974, an exceptionally good year, to Frs.9.2bn.

Derivative

But these satisfactory figures were due mainly to military aerospace sales which, according to the latest statistics, make up more than half of France's total arms sales. Dassault, whose highly successful Mirage family continues to ensure its viability and whose delta-winged derivative of the Mirage III, the 2000, has aroused strong interest among potential purchasers, particularly in the Middle East, is still in a relatively favourable position. Aerospatiale, on the other hand, has registered its fourth successive annual loss—Fr.457m. (254m.) in 1975—much of which can be put down to the funds it has sunk into Concorde and Airbus.

Indeed, if the aerospace industry were run on strictly business lines, France would long ago have concentrated entirely on military aircraft, helicopters and tactical missiles. But, as in the case of the U.K., political considerations are all-important. France, like the U.K., wants to remain a major civil aircraft manufacturer. Its

Robert Manton
Paris Correspondent

Lags in Soviet civil development

THE BIG question hanging over the Soviet aviation industry this autumn is what has happened to the Tu-144, the Concorde of the East. This Soviet supersonic transport was to have started regular internal passenger services during the summer, following the inauguration of twice weekly cargo flights between Moscow and Alma Ata last Christmas.

Since May, however, there has been no word about plans for the airliner, reinforcing beliefs in the West that the Russians are still encountering difficulties.

These most likely centre on excessive fuel consumption (which may explain why its first route, to Alma Ata, is only 2,000 miles) and vibration. It is impossible to be certain, however, since the aircraft has been kept well away from Western eyes for some months. The only indication that plans are still moving forward was the announcement in mid-summer that Aeroflot would be the same as sub-sonic, in the true egalitarian spirit.

The Russians have also cautiously begun to enter the controversy over supersonic flight by producing evidence to show that its effects on the environment, particularly to ozone layer, are minimal. They have not, however, said anything about noise, or commented publicly on Concorde, though in private they naturally welcome its growing acceptance.

Shrouded

But important though the Tu-144 is to the Russians for technological and prestige reasons, it is only a small part of what is probably the largest national aircraft industry in the world (most of it shrouded in secrecy and very few figures available).

Production of military aircraft has reached impressive levels, and from the West's point of view, worrying levels. The new generation of MiG 25s, now being widely deployed in Central Europe along with the MiG 23, has greatly strengthened the Warsaw Pact's fighter/interceptor capability. The Su-19 "Fencer" variable wing fighter bomber is rated alongside the American F-111, for an aircraft of this type while the Backfire bomber, with its range and armaments, is classified by the West as a major strategic weapon.

Production of military aircraft is believed to be running at well over 1,000 a year, mainly of swing-wing tactical types. But despite the industry's advances, many of these aircraft are variations of long-standing models rather than completely new types. The "Fitter", for instance, is the only known instance in world

PRINCIPAL SOVIET CIVIL AIRCRAFT			
	speed (mph)	range (statute miles)	maximum capacity (passengers)
In service:			
Tu-144 (SST) ...	1,430	4,000	140
Il-62M ...	540	6,600	198
Il-76 (cargo) ...	520	3,500	40 tons
Tu-154 ...	605	1,500	164
Yak-40 ...	290	1,118	40
Tu-134A ...	520	1,500	78-90
Due for introduction:			
Yak-42 ...	540	1,118	100-120
Il-86 (airbus) ...	600	1,000	350
An-28 (turboprop) ...	220	650	15

The neat 40-seat Yak 40, on which Russians pinned high hopes because of its undoubted versatility, has achieved only small success to date.

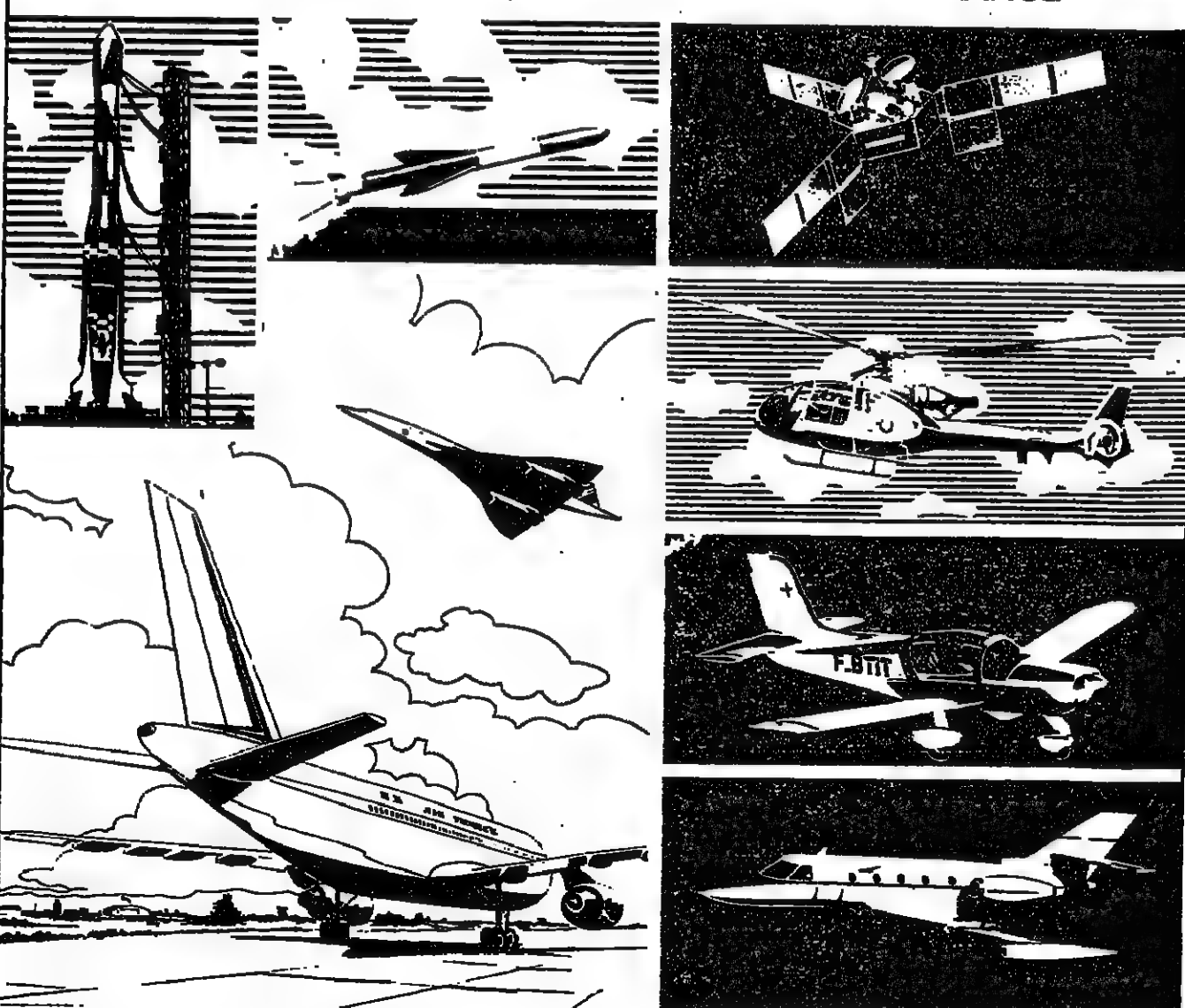
The problem is one of reputation. Soviet aviation is still viewed with suspicion, especially when it comes to entrusting one's life to it. It is also one of the performance and expectations. (There have been reports of disaster among the East European lines: the Poles have indicated their intention of equipping the national Lot with U.S. aircraft.) The Russians have also been unlucky with their latest aircraft, the Tu-154. A crash in the short time they have been in operation.

Presumably there are prospects for the export Tu-144s, since there is on competitor, Concorde, ever as Concorde's maker found, it is not exactly a market, and there are countries in the Soviet which could afford to make good use of an SS But the expansion of the "largest airline in the world" (though the size of the fleet is a State secret), it is direct to 90 international nations, the latest being Moscow, as from July. R sharing rights across Siberia the Far East have also proved useful to Western airlines, both cargo and passengers. year. Aeroflot carried passengers, and expects to carrying 127m. by 1980.

David Lasce
East Europe Correspondent

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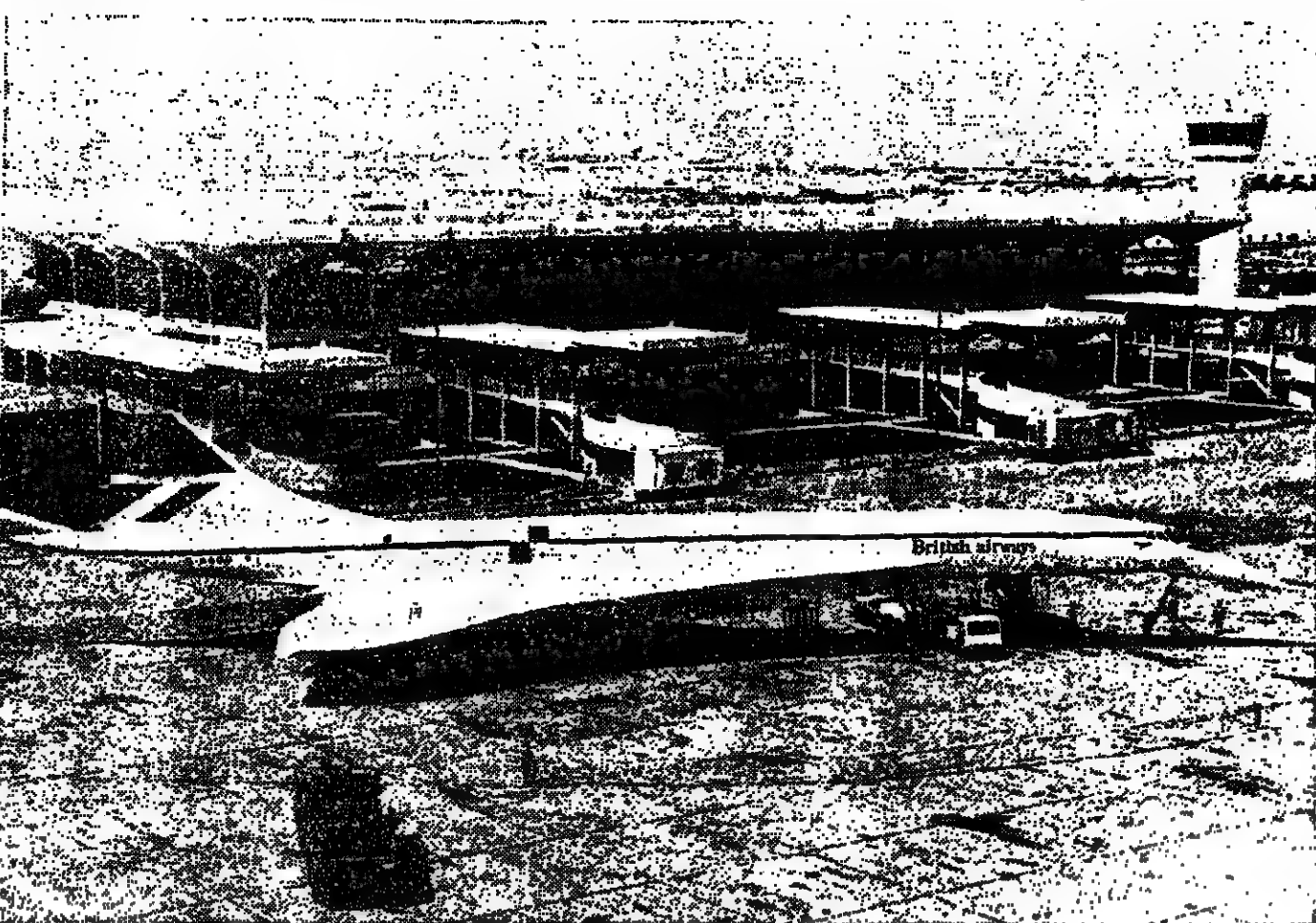
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AEROSPACE XIII

Airports fail to ease congestion problems



Concorde at Dubai Airport.

WITH the resumption of air passenger and cargo traffic growth—albeit at a slower rate than the industrial recession—many of the problems that are confronting the world air transport industry before the recession began are likely to return, and especially so where governments and regulatory authorities have not used the intervening period of respite to review and improve their aviation systems.

One of these problem areas is that of airports. It was a problem before the recession in many countries, because the rate of passenger traffic growth, averaging 12 to 15 per cent a year, was forcing more and more passengers and aircraft into an airports system that was not expanding at the same rate.

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While no official figures are available for the current volume of airport development world-wide, it has been estimated that total spending on new airports is not likely to be less than £1bn. between now and 1990, and may well be considerably more, while if the sums that will be spent in improving the existing airports system are also taken into account, this figure could probably be multiplied several times.

Total spending

The British Airports Authority itself has always maintained that the air transport recession would be temporary and that sooner or later growth would be resumed. As a result, it has been spending substantial sums on improving facilities at all its airports, with further substantial outlays—amounting to about £150m.—planned up to 1990. This funding is designed to ensure that, notwithstanding the slower rate of growth in traffic, the major U.K. airports will remain capable of meeting all the demands placed upon them up to the mid-1980s.

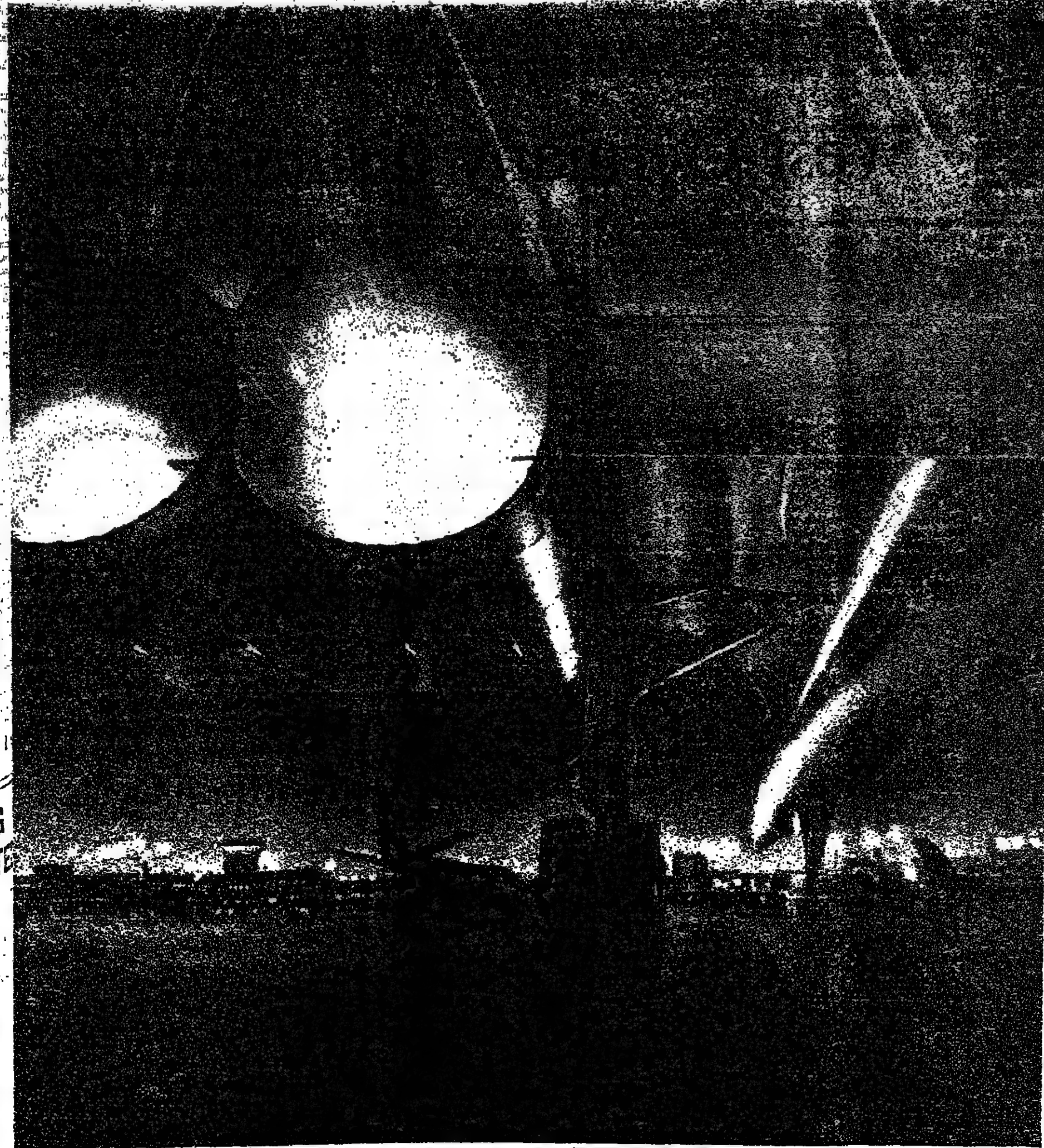
The BAA developments, for example, are aimed at making Heathrow capable of handling 38m. passengers a year by 1985, Gatwick 18m. and Stansted 1m. Also in the London area, Luton Corporation is developing Luton airport to handle 3m. passengers a year. In addition, the BAA is financing

planning suggests that it will eventually be required to handle between 6m. and 8m. passengers a year, with a total of about 30 stands for wide-bodied aircraft if developed for long-haul traffic, or 25 stands (including 12 for wide-bodies) if developed for short-haul work.

These developments are either already under way, or are envisaged, to meet the anticipated growth by 1985. It is beyond that date that some significant further problems seem likely to occur, especially if the current forecasts of continued air traffic expansion prove to be well-founded. For example, some forecasts have suggested that the traffic at the four South-East airports alone might reach 70m. a year by the mid-1980s, rising thereafter to reach as much as 100m. a year or so by 1990.

Sludge works

Because of the long "lead times" involved in the development of any new airport, much of the planning for what may have to be undertaken after 1985 must be done in the years immediately ahead. For example, it will have to be decided in the next two to three years whether a fifth



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AEROSPACE XV

Swedish industry awaits big order

SWEDEN'S AEROSPACE industry is fast approaching a watershed. By next spring the Swedish Parliament is expected to authorise the next five-year defence procurement programme, involving a decision on whether Saab-Scania shall be given the go-ahead to develop and produce a lightweight strike/trainer aircraft for the Swedish Air Force to replace the Viggen towards the end of the '80s.

Much will depend on the recommendations of the Parliamentary Defence Commission which has been sitting since the election. A decision against the domestic development of a new aircraft would entail the running down of Saab-Scania's aerospace division and, most pertinently, the actual laying-off of the 2,000-strong research and development staff at the company's Malmö headquarters. Over the past few months the debate within the Swedish military and political establishments over the desirability of tailoring an independent aircraft manufacturing capacity is becoming intense. Since World War II independence of defence supplies has been an automatic part of Swedish neutrality, but with the growing complication and rising cost of domestic production has come an increasingly difficult reconciliation with military demands for sufficient effective weapons to maintain a credible defence posture. This conflict is particularly apparent in air defence.

A pointer to Government thinking may have come last spring when a request from the Defence Procurement Board (FMV) for funds to research a new aircraft was turned down and the Defence Minister, Mr. Eric Holmqvist, remarked at the Board and Saab-Scania were trying to push ahead faster than the Government was prepared to decide. At the same time both the Air Force and the Board have been instructed to investigate thoroughly all alternatives to the development of a new Swedish aircraft. A Swedish team earlier this year visited the Fort Worth headquarters of General Dynamics of the U.S., producer of the F-16 which last year won the competition for the four-nation Nato order.

Saab-Scania managing director Kurt Milikowsky has stressed, however, that the issue remains open. Mr. Milikowsky reacted promptly to suggestions from senior Air Force officers that an eventual replacement for the Viggen would have to be bought from a foreign supplier, in order to obtain the quantity needed, by underlining the credibility which the domestic aerospace industry lends to Sweden's policy of neutrality and its importance for the country's industrial expertise. Senior officials within the Defence Procurement Board have also questioned whether it would be decisively cheaper for Sweden to buy abroad or manufacture under licence that go ahead with the development of its own aircraft. No definitive cost calculations either way have yet been published.

Facilities

Leakages from the Defence Commission suggest that its majority has been leaning towards a solution which would entail the development by Saab-Scania of a new trainer aircraft to replace its SK-60 due to go out of service with the Air Force in the mid-80s and the production under licence of a foreign interceptor to replace the Viggen in the 90s. Such a programme would probably help to maintain Saab-Scania's production facilities but would involve far less development work than the strike/trainer project, designated B3-LA, and would almost certainly entail the reduction of the company's ability to develop new aircraft of its own.

Development costs for a trainer to replace the SK-60 are put at some Kr.100m. (£12.5m.) against Kr.1.52bn. (£190m.) for the B3-LA. Saab-Scania has already developed an advanced export version—the S-105—of the SK-60, which it has sold to Austria and which it is putting forward, in competition with the Hawker Siddeley Hawk and the French Alpha-Jet, for an order from the Finnish Air Force.

The possibility that the September election may put an end to 44 years of Social Democrat rule in Sweden does not necessarily imply any reversal of either Defence Commission or Parliamentary thinking on defence. Among the three non-Socialist parties which would form a government only the Moderates (Conservatives) are likely to stand firm for the preservation of an independent Swedish aircraft capacity. The Centre Party and Liberal representatives on the Defence Commission appear to have concurred in the main with the Social Democrats' views. It is stressed, however, that the Commission has called for complementary information on the possibilities and costs of alternatives and has not yet formulated its recommendations.

The position of Saab-Scania and of a replacement for the SK-60 trainer would not together provide enough work for its 3,000-strong research and development team. The B3-LA project is thus vital for Saab-Scania. Trade union officials at Linköping have warned the Government that failure to order development of the B3-LA Volvo Flygmotor from the would lead to redundancies original Pratt and Whitney engine.

It can safely anticipate an order to go ahead with the development and production of a new strike version based on the more powerful JA-37. Development of this new strike Viggen When the Viggen was first mooted, production of some 800 aircraft was anticipated for the Air Force: despite increases in defence budget allocations it now appears unlikely that there will be enough money for more than 350. The problem is of equal urgency to the Air Force staff which will have seen the number of squadrons available to it cut back by about a third between the end of the 80s and the early 90s.

The obvious solution would be to obtain export orders, in order to lengthen the production series and reduce unit costs, but from short air strips under greatly varying climatic conditions. Other Swedish companies

the domestic industry—becomes have been called in to help provide this instance a daunting wide project packages based on handicap. Sweden's own political use of the aircraft. One in- ties on the sale abroad of vives plant to produce fertiliser "offensive" weapons are more from city sewage to be spread on restrictive on exports of air- fields or forests by the Trans- craft such as the Viggen than, porter.

Foreign design

It is certain that in design- ing this package they will try to retain as large a proportion as possible of "independence" in weapon supplies as Sweden can afford. Whether the mix provides for development of a new Swedish aircraft or for production of a joint production of a civil aircraft. It has scored a minor success with its MFI-17 Sup- porter, a rugged, light, piston- engine army support aircraft and its Safari civil version.

More recently it has been working on a new project, a Swedish avionics and weaponry light, multi-purpose transport and ensure new orders, for aircraft below the 5.7-ton weight Swedish companies, such as L. M. Ericsson, AGA and Loping countries or under Svenska Radi, which currently produce radar, guidance and ing conditions. Powered either other flying instruments for the by four piston or two turbo- Viggen. The big question to be prop engines, it has been named settled next year, however, is the Transporter, is designed to take up to two tons of freight or 19 passengers and to operate from short air strips under

William Dullforce
Nordic Correspondent



SAAB Viggen all-weather attack aircraft.

West Germany

CONTINUED FROM PREVIOUS PAGE

Then found it hard to pin down West Germany's war-time aircraft were again allowed to get back into the aircraft business. Fifteen years of not very commercial inventiveness and financial floundering led to the consolidation of the industry into the three groups that it consists of to-day.

The largest of the three West German aerospace companies is Messerschmitt-Boelkow-Blohm with a total workforce of just under 20,000 and turnover in 1976 of DM1.5bn., of which some 1bn. was paid by the Government. Although undercapitalised and heavily dependent on the Government for business, MBB is well-supplied with contracts and should increase its total turnover to around DM3bn. by 1980. Its most obvious success has been the BO-105 helicopter of which it has now sold 300 and which has delivered 200. This light helicopter, with fixed, rather than hinged, rotor blades has found wide acceptance and will shortly be introduced by the German armed forces in the new guise of launching platform for anti-tank missiles.

Missiles

MBB is also the main German contractor for the MRCA and now this vast contract has been given the production go-ahead it will be a steady factor in MBB's employment. Another area of military production with good prospects is the missile business where MBB has developed and is marketing a number of successful anti-tank and anti-aircraft missiles in partnership with Aerospatiale of France.

sharply down to DM377m. The mainstay of this company's activities is the Alpha-Jet, a close support and training jet, developed with Dassault/Breguet of France. Series production of this aircraft is now getting under way and with 400 units already ordered by France and West Germany, and a further 33 by Belgium, Dornier's manufacturing capacity will be well used for a few years. Dornier is also the producer of the only other privately developed and commercially successful aircraft produced by the German aerospace industry since the war, the Skyvaster two-engine utility aircraft. In 1973 Dornier employed a total of 6,700 people. The third West German aerospace concern is the German/Dutch company VFW-Fokker which was formed by a merger in 1969 after nine years of increasing co-operation. Total sales last year were up by 15 per cent. to DM1.59bn. There are 18,000 people on the company's payroll. VFW-Fokker is the most problematic of the German companies in this business. Part of its trouble is due to the fact that only a relatively small part of its turnover, 33 per cent., is derived from weapon sales. The bulk comes from a series of technically successful but commercially vulnerable ventures in the civil aircraft field. So far the company has sold only 16 of its 44-seater jet—the VFW-614. Hopes for sale of this aircraft to the U.S. Coastguard have all now been thwarted by what appears to be protectionist reluctance in America.

VFW-Fokker also builds the F-28 jet airliner of which it has sold 113, and the very successful F-27 turboprop for which there is still a lively demand 20 years after its introduction. It, too, is involved in the German contribution to the Airbus programme, with a 35 per cent. holding in Deutsche Airbus.

The costs associated with this line of civil aircraft and the unsatisfactory degree of job security that they generate are the company's key problem. VFW-Fokker made a profit in 1975 of DM5.8m., but in 1976 and 1977 only break-even is expected. Both sides of the company have applied to their respective governments for financial assistance. At a difficult moment in the company's fortunes there are bound to be rumours of an impending national split in the company. These are strongly denied by the management.

The other wholly German aerospace company, and perhaps the most appealing from an entrepreneurial point of view, is Dornier. The family-owned company returned a profit last year, though its turnover was sharply down to DM377m. The mainstay of this company's activities is the Alpha-Jet, a close support and training jet, developed with Dassault/Breguet of France. Series production of this aircraft is now getting under way and with 400 units already ordered by France and West Germany, and a further 33 by Belgium, Dornier's manufacturing capacity will be well used for a few years. Dornier is also the producer of the only other privately developed and commercially successful aircraft produced by the German aerospace industry since the war, the Skyvaster two-engine utility aircraft. In 1973 Dornier employed a total of 6,700 people. The third West German aerospace concern is the German/Dutch company VFW-Fokker which was formed by a merger in 1969 after nine years of increasing co-operation. Total sales last year were up by 15 per cent. to DM1.59bn. There are 18,000 people on the company's payroll. VFW-Fokker is the most problematic of the German companies in this business. Part of its trouble is due to the fact that only a relatively small part of its turnover, 33 per cent., is derived from weapon sales. The bulk comes from a series of technically successful but commercially vulnerable ventures in the civil aircraft field. So far the company has sold only 16 of its 44-seater jet—the VFW-614. Hopes for sale of this aircraft to the U.S. Coastguard have all now been thwarted by what appears to be protectionist reluctance in America.

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And it incorporates numerous other advances, like the new Collins automatic flight control system, and new solid state AC power generation system. There are also improvements in appearance and aerodynamic efficiency.

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Nicholas Colchester
Bonn Correspondent

AEROSPACE XVI

Favourable view in the Netherlands

DESPITE THE rather difficult situation in the world aviation market, there have been a number of favourable developments for the Dutch aerospace industry and its main proponent, Fokker. This Dutch arm of the Gorman-Dutch VFW-Fokker company has shared in most of them. But the company still faces uncertain sales prospects for its aircraft.

The domestic aircraft industry, centred around Schiphol, has, however, shown significant activity, particularly last year when numerous Dutch factories were in difficulties as a result of the recession and massive short-time working had to be introduced.

Fokker has escaped most of this. But though it is still able to report "good" order books for its ever-popular F-27 Friendship turbo-prop commercial aircraft, the position regarding the F-28 Fellowship is by no means bright. Capacity expansion plans have been adapted and the Fokker company has "urgently requested" the Government in The Hague for some form of marketing support in the credit sector.

The company said it was facing "cut-throat" competition from U.S. manufacturers, who are much aided by a comparatively cheap dollar, certainly when compared to the guilder. Steep rises in costs in the Netherlands are another negative factor. It appears, however, that the Netherlands Government does have an ear for the company's problems, having finally decided not so long ago, and to the great relief of the industry as a whole, that advanced technology was something that was there to stay in the Netherlands.

It had allocated money to Fokker for studies on a successor to the F-28, which it is "earnestly hoped, will one day become a 'European' aircraft. And it was recently made known that the Economics Ministry has decided to set up a study group to look into the F-28 marketing problems.

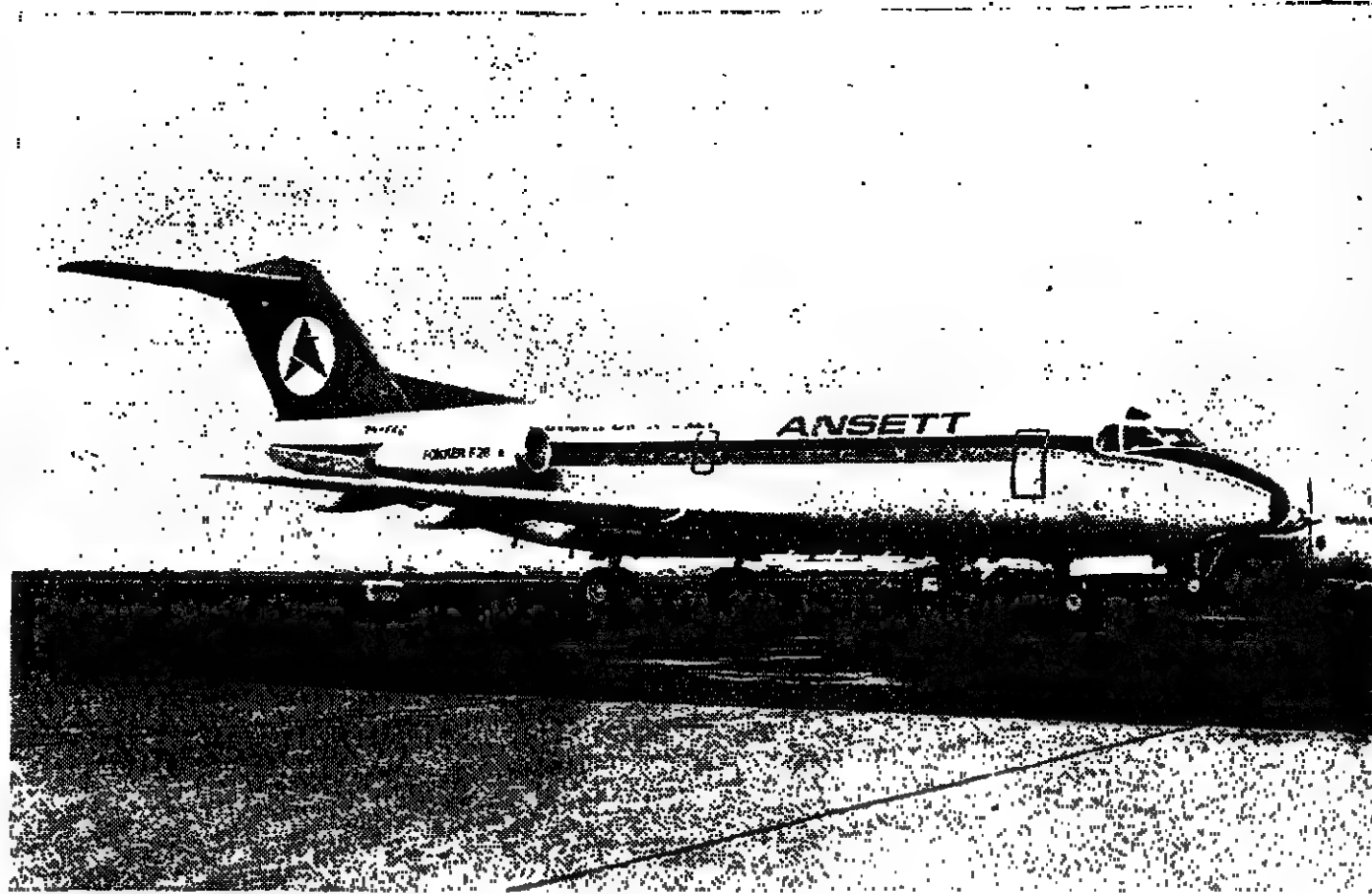
Finally, the Science Ministry has decided to set aside money for a possible new space project, to succeed the successful "ANS" project, the launch of a satellite which only recently completed operations. Nothing is known about the Economics Ministry's decision on aid for F-28 sales—the company employs some 8,000—but Fokker executives have good hopes. As regards the development study involving the new F-28 as aircraft for the 1980s, the grant obtained was Fls.2.5m.

Pleas

It is understood that Fokker has also asked the Government for a Fls.25m. subordinated loan to improve its capital base. The company has also made several pleas to the Government for financial support for the A 300B Airbus project—in which its participation as a sub-contractor has not been financially rewarding, but can be maintained as a subcontractor for the parts. The German arm of the group is a full participant, as the W. German Government was prepared to release the necessary funds.

This year the long-awaited signatures were put to the various contracts involving industrial compensation work and co-production of the military fighter replacing the ageing Starfighters, the General Dynamics F-16. This follows the co-production agreement signed last year between the U.S. Government and the four European countries—the Netherlands, Belgium, Norway and Denmark—which had opted for the General Dynamics aircraft. The countries have been sold and there are good hopes for the future.

A Fokker spokesman said great hope was pinned on a possible order from the U.S. Coastguard services, which was in the market for around 40 aircraft. Although it is accepted that the U.S. market is almost impossible to penetrate following surcharges on imports, it is thought Fokker said in its 1975 annual report that SABCA's work on



Fokker Fellowship in the colours of Ansett Airlines of Australia.

commercial aircraft was focused on the share in the production of the F-28 and the VFW 614. Work on the latter aircraft is also carried out at Schiphol, and after a difficult start 16 planes have been sold and there are good hopes for the future.

Companies involved in the programmes include Fokker and the Philips Company Hollandse Signaal. In Belgium the VFW-Fokker affiliate S.S. Belge de Construccions Aeronautiques (SABCA) will also be benefiting from the F-16 work. VFW-Fokker said in its 1975 annual report that SABCA's work on

planes. A decision is expected after the U.S. Presidential election. Fokker earlier brought out a new version of the F-27, the Maritime II, which is specifically designed for supervising traffic on coastal shipping lanes, drilling rigs and patrolling over territorial fishing areas. Additional tasks include search and rescue operations. Series production has yet to start, but the company, which has already received two orders from South America, has good sales hopes.

Fokker has said of the work transfers. According to the contract that complete assembly of the

this would be worth around with General Dynamics, the Fls.1.65m. at January, 1975, work comprised the final prices. The workforce involved assembly of 174 aircraft destined for the air forces of the Netherlands and Norway. In addition, recent changes in marketing Fokker will manufacture parts conditions. It would have for 564 aircraft, with about 170 enough spare capacity left in sets being used for the Dutch the Netherlands not to have to assembly line. SABCA and fan out some of the F-16 work Fairley in Belgium will receive to subsidiary companies in West about 170 of the sets for the Germany. It is understood that final assembly line for the this is a result of lagging Belgian and Danish F-16. The fellowship sales. Trade unions remainder will be delivered to in the Netherlands had in early General Dynamics to build into stages opposed any such Fokker aircraft for the U.S. Air Force.

The company also said in July difficulties in marketing aircraft such as the Fokker F-28 and

first aircraft should be ready making a plea for State aid in mid-1978, while delivery of ance, also warned the Gove the first sets of components is ment on its policy regarding due for spring, 1978. Fokker grant of export licences for i will also be involved in further Fokker aircraft. It rejected c orders from third countries, or two recent happenings w Interestingly, a number of the issue of such permits a Dutch medium-size and smaller clouded by political consid companies in the field of fine tions. It noted that the dam mechanical techniques and lic aircraft industry had ai technology joined forces not the 1950s consciously sta long ago into a form of "aero- away from manufacturing m tary aircraft, restricting its space" group.

The Netherlands Agency for Aerospace Programmes (NIVR) noted in its 1975 annual report that although the group had in the first instance been set up to participate in the General Dynamics co-production programme, it wants to eventually enhance its chances of being accepted as suppliers in aircraft and aerospace projects. "This could possibly be the first step towards an association of Dutch aircraft and aerospace industries, for which we have been issuing pleas repeatedly," the NIVR stated.

Besides military orders, a number of Dutch companies have earned themselves a reputation in the space field. Following the completion of the transatlantic market for a "ANS" project, the Dutch company. The company's industry was entitled to call itself "space qualified," and taken a rather more positive view of the recently disclosed with the aid of the Government Aerospace-McDonnell-Douglas-Dassault decision in principle this status. The Cabinet to build the medium-range decided early in 1975 to release "Mercurie" passenger airline funds from its budget for "big than the U.K. has.

It likes the prospect of U.S. technological development projects for a preparatory study for the possible development of a second Dutch infrared astronomical satellite (IRAS) within an international co-operation programme. The sum allocated was Fls.3.2m. The Dutch partners are Fokker and Hollandse Signaalapparaten, ever, Government assistance needed for any such participation and the company pointed out that such project including plans for the Boen 737, are still a long way from crystallisation.

In its annual report, the NIVR, besides discussing the difficulties in marketing aircraft such as the Fokker F-28 and

Positive

Fokker is actively watching developments in the European and American aircraft business on efforts to reach certain operation agreements. VFW-Fokker said in its annual report, the discussions were interesting, "not least with a view to a possible improvement of a transatlantic market for a company." The company's industry was entitled to call itself "space qualified," and taken a rather more positive view of the recently disclosed with the aid of the Government Aerospace-McDonnell-Douglas-Dassault decision in principle this status. The Cabinet to build the medium-range decided early in 1975 to release "Mercurie" passenger airline funds from its budget for "big than the U.K. has.

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Michael van O
Amsterdam Correspondent

BRITISH AIRCRAFT CORPORATION

does much more than break sales records for aircraft and defence weapons.

It has also won export contracts to provide comprehensive ground support and training services which are already worth many hundreds of millions of pounds.

Today well over 2,000 BAC engineers are working abroad. They have been publicly praised for their adaptability and skill, and their efforts have enhanced the reputation not only of BAC but of Great Britain.

Aircraft like Concorde, Jaguar and the Tornado multi-role combat aircraft, and weapons such as Rapier, Swingfire and Seawolf have already placed BAC at the forefront of advanced technology. They are the best of their kind.

At the same time, BAC has established a powerful ability in Space, and its associated and sophisticated electronics. Its many successful satellite programmes have included a considerable contribution to the Intelsat communications series which today spans the Earth.

BAC's experience of the organisation and management of major collaborative projects is unrivalled, and its reputation for quality engineering and service is such that its products have been consistently sold to over half of all the countries of the world.

BAC can justly claim that the breadth and depth of its experience and expertise in every major discipline of Aerospace are unique.

It is because of this strength that BAC is one of the Nation's greatest export winners of all time.

*Concorde is built in collaboration with Aérospatiale of France; Jaguar with Dassault-Breguet of France; and Tornado with MBB of Germany and Aeritalia of Italy.

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P.F. Private Development Finance Company of Indonesia, Jakarta City Bank, Hawaii

OVERSEAS MARKETS

EUROBONDS

New issue volume hits prices

BY MARY CAMPBELL

WITH NO LET-UP in the pace of new issue announcements, the U.S. dollar secondary market showed increasing signs of strain last week. That it is the sheer weight of new issues which is keeping the market down there can be no doubt—interest rate factors are seen as if anything pointing the other way.

Of the issues which were priced last week, both tranches of the Michelin were being quoted on Friday about a point down on their offering prices of 98 1/2 for the 9 1/2 per cent, 12-year bonds, and 99 1/2 for the 9 1/2 per cent, seven-year notes. The 15-year Norsk Hydro fell to a discount of around a half point from an offering price of 99 1/2 on the 9 per cent coupon, with a further fall to 98 1/2 being reported late on Friday. The Ontario Hydro and Sydkaft issues held up rather better, but were still being quoted below their issue prices of 99 1/2 and 99 respectively.

The major U.S. dollar issue announcement last week was \$100m for Denmark With Union Bank of Switzerland as lead manager, the issue offers an indicated coupon of 8 1/2 per cent on an eight-year maturity. The

other two new issue announcements were \$25m for Newfoundland Municipal Finance Corporation, which offers an indicated 9 1/2 per cent, and \$20m for Macmillan Beritz for five years, indicated at 9 per cent, via Orion.

Formally announced over the week-end was the first ever Australian dollar denominated Eurobond issue. Hitherto, the Australian dollar has been seen in the Eurobond market only in the case of the new issue payments will be made in U.S. dollars, it is an Australian dollar currency risked current exchange rate will be used each time payments are made.

The borrower is the Australian Industrial Development Corporation and the size of the seven year issue, Aus\$15m. The pricing is expected to be at a discount of 10 per cent. The lead managers are Schroder Wagg and the Swiss Guvillier Kurz Bungeger. There is no state guarantee but the borrowing institution is state-owned.

The D-mark sector of the market was particularly firm last week with a shortage of new domestic issues combining with the strength of the currency to

raise demand. The indications on Friday were that the World Bank's DM400m, financing had gone well. Hard on its heels the European Investment Bank, another borrower whose issues are exempted from the limits set by the Capital Markets Sub-Committee, came to the market with a DM100m private placement. The indicated pricing is 7 1/2 per cent, at a seven year maturity with Westdeutsche Landesbank as lead manager.

Issues on the regular calendar last week were DM100m for ten years at an indicated 9 1/2 per cent, for Brazil, via Deutsche Bank, with investors' option to redeem after six years, and the Mitsui Tsutsu private placement. This offers an indicated 7 1/2 per cent at 9 1/2.

The next two issues in the Swiss franc sector will be SwFr\$50m, at 6 1/2 per cent, and the Asian Development Bank with a view to passing it back to their syndicate.

On Thursday and Friday, the result of this — and of the weeks ago the Zaire delegation was led by the Governor of the central bank.

The position of the 11 banks attending the meeting is delicate since they are all agents for loans to Zaire on which payments are overdue; at this moment in time when the legal action against European American is at the top of everyone's mind, all the banks are sensitive that a false step by them might lead to legal action against them by another member of their syndicate.

So far as can be understood, the result of the meeting and of the fact that the Zaire delegation appear to have arrived armed with a long presentation — including debt rescheduling suggestions — was that the banks did no more than take note of what the Zaire delegation said with a view to passing it back to their syndicate.

The fact that the advice of the Bank of England should have been sought on the thorny question of who should hold the risk of the market was the subject of the meeting and that one of the Bank's advisers should have been brought forward to act as "moderator," albeit in a personal capacity, added a further touch of formality.

AUSTRALIAN WEEKLY LIST

Australian \$	Sept. 5	Sept. 6	Australian \$	Sept. 5	Sept. 6
Advertiser Newspaper	11.28	11.72	Woolworths	10.90	10.95
Amcor Transport	11.18	11.16	Woolworths	10.90	10.95
Amcor Transport	11.18	11.16	Woolworths	10.90	10.95
Amcor Transport	11.18	11.16	Woolworths	10.90	10.95
Amcor Transport	11.18	11.16	Woolworths	10.90	10.95
Amcor Transport	11.18	11.16	Woolworths	10.90	10.95
Amcor Transport	11.18	11.16	Woolworths	10.90	10.95
Amcor Transport	11.18	11.16	Woolworths	10.90	10.95
Amcor Transport	11.18	11.16	Woolworths	10.90	10.95
Amcor Transport	11.18	11.16	Woolworths	10.90	10.95

TEL AVIV STOCK EXCHANGE

Company	Price	Change	Company	Price	Change
Bank Leumi Ltd.	207.5	-1.0	Bank Leumi Ltd.	207.5	-1.0
Bank Leumi Ltd.	207.5	-1.0	Bank Leumi Ltd.	207.5	-1.0
Bank Leumi Ltd.	207.5	-1.0	Bank Leumi Ltd.	207.5	-1.0
Bank Leumi Ltd.	207.5	-1.0	Bank Leumi Ltd.	207.5	-1.0
Bank Leumi Ltd.	207.5	-1.0	Bank Leumi Ltd.	207.5	-1.0
Bank Leumi Ltd.	207.5	-1.0	Bank Leumi Ltd.	207.5	-1.0
Bank Leumi Ltd.	207.5	-1.0	Bank Leumi Ltd.	207.5	-1.0
Bank Leumi Ltd.	207.5	-1.0	Bank Leumi Ltd.	207.5	-1.0
Bank Leumi Ltd.	207.5	-1.0	Bank Leumi Ltd.	207.5	-1.0

HONG KONG

Company	Price	Change	Company	Price	Change
Amoy	1.68	1.85	Amoy	1.68	1.85
Amoy	1.68	1.85	Amoy	1.68	1.85
Amoy	1.68	1.85	Amoy	1.68	1.85
Amoy	1.68	1.85	Amoy	1.68	1.85
Amoy	1.68	1.85	Amoy	1.68	1.85
Amoy	1.68	1.85	Amoy	1.68	1.85
Amoy	1.68	1.85	Amoy	1.68	1.85
Amoy	1.68	1.85	Amoy	1.68	1.85
Amoy	1.68	1.85	Amoy	1.68	1.85

CORAL INDEX

Close 351.356

L.G. INDEX 01-351 3466

DECEMBER 1976-4010

Investment premium based on 52.60 per 11-100% (100%)

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Investment premium based on 52.60 per 11-100% (100%)

JOHANNESBURG MINES

Company	Price	Change	Company	Price	Change
Anglo American Corp.	1.20	-0.05	Anglo American Corp.	1.20	-0.05
Anglo American Corp.	1.20	-0.05	Anglo American Corp.	1.20	-0.05
Anglo American Corp.	1.20	-0.05	Anglo American Corp.	1.20	-0.05
Anglo American Corp.	1.20	-0.05	Anglo American Corp.	1.20	-0.05
Anglo American Corp.	1.20	-0.05	Anglo American Corp.	1.20	-0.05
Anglo American Corp.	1.20	-0.05	Anglo American Corp.	1.20	-0.05
Anglo American Corp.	1.20	-0.05	Anglo American Corp.	1.20	-0.05
Anglo American Corp.	1.20	-0.05	Anglo American Corp.	1.20	-0.05
Anglo American Corp.	1.20	-0.05	Anglo American Corp.	1.20	-0.05

INDUSTRIALS

Company	Price	Change	Company	Price	Change
Anglo American Corp.	1.20	-0.05	Anglo American Corp.	1.20	-0.05
Anglo American Corp.	1.20	-0.05	Anglo American Corp.	1.20	-0.05
Anglo American Corp.	1.20	-0.05	Anglo American Corp.	1.20	-0.05
Anglo American Corp.	1.20	-0.05	Anglo American Corp.	1.20	-0.05
Anglo American Corp.	1.20	-0.05	Anglo American Corp.	1.20	-0.05
Anglo American Corp.	1.20	-0.05	Anglo American Corp.	1.20	-0.05
Anglo American Corp.	1.20	-0.05	Anglo American Corp.	1.20	-0.05
Anglo American Corp.	1.20	-0.05	Anglo American Corp.	1.20	-0.05
Anglo American Corp.	1.20	-0.05	Anglo American Corp.	1.20	-0.05

CANADIAN WEEKLY LIST

Company	Price	Change	Company	Price	Change
Alcan Inc.	1.20	-0.05	Alcan Inc.	1.20	-0.05
Alcan Inc.	1.20	-0.05	Alcan Inc.	1.20	-0.05
Alcan Inc.	1.20	-0.05	Alcan Inc.	1.20	-0.05
Alcan Inc.	1.20	-0.05	Alcan Inc.	1.20	-0.05
Alcan Inc.	1.20	-0.05	Alcan Inc.	1.20	-0.05
Alcan Inc.	1.20	-0.05	Alcan Inc.	1.20	-0.05
Alcan Inc.	1.20	-0.05	Alcan Inc.	1.20	-0.05
Alcan Inc.	1.20	-0.05	Alcan Inc.	1.20	-0.05
Alcan Inc.	1.20	-0.05	Alcan Inc.	1.20	-0.05

HYGRADE FOODS, the food group, recently acquired by Hanson Trust who own 50 per cent, suffered a sharp reversal in third quarter earnings. Our New York writes. Net earnings of \$1.1m, or \$1.37 a share, compared with \$1.5m, or \$1.87 a share. Sales show an increase to \$132.5m, from \$98.5m, due to the reopening of a closed plant, which was a temporary sales but no profit, said a W. G. Torrance, the treasurer of Hygrade Foods. The decline in profits was explained by the "abundance of the making the beef slaughter prices depressed."

SEVEN MONTHS net earnings of \$1.1m, or \$1.37 a share, compared with \$1.5m, or \$1.87 a share. Sales for the period are \$132.5m, compared with \$98.5m, due to the reopening of a closed plant, which was a temporary sales but no profit, said a W. G. Torrance, the treasurer of Hygrade Foods. The decline in profits was explained by the "abundance of the making the beef slaughter prices depressed."

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SEVEN MONTHS net earnings of \$1.1m, or \$

HOME NEWS

Flags of convenience ships threat to safety—report

BY JOHN WYLES, SHIPPING CORRESPONDENT

FRESH evidence that ships registered in Liberia, Panama, Honduras and other newly emerging flags of convenience countries are a continuing threat to safety and anti-pollution standards is contained in a study to be published shortly.

The 137-page research report, sponsored by the Social Science Research Council, will fuel the long-running post-war debate over flags of convenience fleets. Leading the opposition, the International Transport Workers' Federation repeatedly has organised ineffectual boycotts against flags of convenience ships because of their rates of pay and working conditions. Shipowners, particularly Americans and Greeks, have put increasing numbers of their vessels under these flags because of the undeniable commercial advantages they offer.

The authors of the study, The Impact of Flags of Convenience, Professor R. S. Doganis and Dr. B. N. Metaxas, argue that nearly 25 per cent. of world shipping has been attracted to flags of convenience because shipowners can avoid tax obligations and terms and conditions of employment which would apply if they registered their ships in their own countries. As a result, other maritime countries, including Britain, have been forced into a competition which has depressed potential Government revenues and failed to maintain employment opportunities for native seafarers.

Tax

At the end of the Second World War, Panama and Honduras were the only significant flags of convenience and together they amounted to only 2 to 3 per cent. of world tonnage. Since then, the Liberian flag has mushroomed from 50,000 gross tons in 1949 to 65,25m grt in mid-1974 and has been growing at an annual rate of 10 per cent., compared with

the 6.8 per cent. annual increase in the world fleet up to July, 1974.

During the same period, the elimination of tax advantages has led to a progressive decline in importance of the Honduran flag. But this has been more than compensated by the emergence of Cyprus, Singapore and the Somali Republic which, by 1974, accounted for 3.4m. grt, 2.9m. grt and 1.9m. grt respectively.

On the basis of an analysis of the total operating costs of a sample of 63 vessels, the study concludes that convenience flags offer a saving of between 14 and 27 per cent. compared with vessels under traditional flags. Vessel size was found to be an important factor, with those in the smaller range tending to show the bigger advantage. Crew costs under traditional regulated flags were found to be "marginally" higher.

The authors say that the cost advantage of the flag of convenience has had a depressive effect on world freight rates and has induced traditional maritime countries to offer subsidies, depreciation allowances and investment grants "which, it is claimed, counter-balance the tax-free operations of convenience owners."

On safety and pollution issues, the study concludes that the flag of convenience owner's relative freedom from regulations has lowered international safety standards. The authors claim that confidential sources, from within one of the world's leading classification societies have confirmed that there has been a progressive relaxation and modification of standards.

This controversial claim provides the background to the study's report that Liberia, Panama and Greece—classified as a "quasi-flag of convenience"—because it offers similar, but not all, advantages—have a higher share of world casualties than their share of tonnage would

suggest. For example, the percentage of casualties of ships registered in Panama and Greece is two to three times higher than their share of tonnage.

Liberia's safety record has improved and is only a few percentage points above its proportion of world tonnage. But, according to the study, all the indications are that the newer registries have an even poorer safety record than Greece or Panama—in 1971 and 1972 Somalia and Greece accounted for just more than 1 per cent. of world tonnage but about 4.5 per cent. of world casualties.

Analysing the incidence of pollution, the study finds that "there are strong grounds for believing that vessels under flags of convenience cause a disproportionately high share of oil spillage and pollution." This is partly because of their demonstrably higher accident rates and partly because the Liberian flag party flags of convenience tankers are smaller and older than the world average and less likely to use modern oil discharge procedures.

Cost

The study argues that flags of convenience ought to be regulated internationally for safety, conditions of employment and pollution control. However, a global analysis of the costs and benefits of these flags offers no guide to individual national shipping policies.

"Each country must consider from its own point of view whether it is better or worse off as a result of flag of convenience shipping and establish its own policies accordingly," the study concludes.

The Impact of Flags of Convenience, by Professor R. S. Doganis and Dr. B. N. Metaxas, study sponsored by the Social Science Research Council, and carried out at Polytechnic of Central London and Baring Technical College, £6.

Brussels plan to tax vegetable oils 'will harm food industry'

BY ELINOR GOODMAN, CONSUMER AFFAIRS CORRESPONDENT

REPRESENTATIVES of Britain's food industry will tell officials from the Ministry of Agriculture this week that any moves in Brussels to tax vegetable oils and fats will harm many sectors of the British food industry and set a "dangerous" precedent which could be used in the future to tackle problems in other agricultural areas.

The Food Manufacturers' Federation will also confirm its members' opposition to the idea, still circulating in Brussels, that food manufacturers should be prevented from using both dairy fats and non-dairy fats in the same product.

This "exclusive use" provision, they claim, would, if implemented, result in the disappearance of many big selling brands—such as instant desserts and some kinds of ice creams—from the British shops, and the loss of many jobs in the food industry.

The federation has already received an assurance from Mr. Fred Peart, Minister of Agriculture, that he is totally opposed to the Commission's proposal to levy extra taxes on vegetable and marine oils and fats.

But the federation is anxious to supply the British Government with facts with which to fight its case at this month's meeting of the Ministers. The feeling is that, while the farming lobby is well represented in Brussels, food manufacturers' interests often go unheard.

The proposal to tax vegetable oils is part of a wider programme designed by the Commission to deal with the problems caused by a surplus of milk production in the Community.

This "co-responsibility" package has five main elements: a reduction of the dairy herd by introduction of a Community system of premiums for the

non-marketing of milk and the conversion of dairy herds; suspension of national and Community aid to the milk sector for three years; introduction of a "co-responsibility levy" under which a temporary levy would be brought in and applied in a uniform manner to all quantities of milk supplied to the dairies and on direct sales of dairy products to the farm; enlargement of Community markets, and the proposed tax on oils and fats.

The federation argues that this package would mean food manufacturers who do not even use milk in their products will suffer as a result of the problems in the dairy industry. The problems of the dairy industry, it claims, should be tackled within the industry itself and not by raising the price of competitive products to protect demand.

The retail price of milk in Britain went up by 1p a pint yesterday, adding around 0.2 per cent. to the Retail Prices Index.

Crisis as man's resources give out

THE industrialised world is facing a "difficult and disagreeable" last quarter of a century because the disappearance of natural resources is threatening to outpace synthetic alternatives. Mr. John Davies, MP, said in his presidential speech to the Incorporated Association of Preparatory Schools at Cambridge.

Adapting to a change of this description demanded understanding, self-discipline and persuasion of a kind we had not tried to develop.

Hops are only here for the beer—in quantity and quality

BY STUART ALEXANDER

ANY FEARS that the drought may have caused a shortage of hops were discounted over the week-end as picking started. The crop is a little early, and will not be a bumper one, but the quality is described as very good and growers are confident they can supply the brewers with all they require.

Cutting and carrying are now largely mechanical. The days when whole families took their annual holidays in the hop fields are long gone. Some student labour will be used in the main hop-growing areas of Kent, and a few gypsies will find jobs in Herefordshire and Worcestershire, but it is estimated that only one in 40 of the casual jobs remains. Before the war the migration involved well over 250,000 people, counting children and babies in arms.

The big brewers have their own gardens but there are an additional 13,150 acres under cultivation, with few growers tending more than 100 acres and few less than 30. Each year increases in the import of suitable hops, mainly from Czechoslovakia and West Germany, by the brewers—for 1976 it is

about 6,900 tons, or 77 per cent. of capacity.

There is no spot price, as all production is taken up on fixed-price contracts with an inflation clause built in. But there is now a forward market up to 1978, in much the same way as there is on the Continent.

"The hops are used to give beer its bitter flavour and are added to the brew during boiling. They have been in use in this country since the 15th century, when they are thought to have been brought over from Holland. Previously brewers relied just on malted barley for the flavour."

More lager

Saxon monks, regarded as great brewers, built a reputation that lasted for centuries using this ingredient.

The cones of the female plant are used with one or two male plants planted alongside in England's gardens to facilitate fertilisation and, therefore, seedling. For Continental lager unseeded cones are used. Growth in sales of that type of beer has led to increases in the import of suitable hops, mainly from Czechoslovakia and West Germany, being developed.

This year the Hampshire hops have been turned over entirely to producing the increased home demand, partly because of EEC rules that there must be no more than 2 per cent. of seeded hops in order to justify the term "less."

The hops are hot-air dried, malted before use. Some are made into powder or pellets also for use in brewing. They have few other uses—unless you are convinced they will help you to sleep by putting them in pillows.

The plants take three years to come into full production and average they have a good working life of 20 years. Then, if grape vines, they are planted out and new plants brought in.

This year the Germans, in short of hops, so the price is rising rapidly. Until now the English hops, as they are called, have been the development of the Hampshire gardens could a new export product be being developed.

Small businesses to consider aid plan

MERSEYSIDE Productivity Association has arranged a meeting in Liverpool tomorrow to outline the Government scheme to help small companies study the possibility of providing joint services for their offices.

Under the scheme, the Industry Department can give financial aid to groups of four or more companies, employing fewer than 200, towards the cost of studying possible joint services such as accountancy, marketing, purchasing or sub-contracting.

Jobless warning

The inadequate Government measures to deal with youth unemployment could lead to this year's 300,000 school leavers becoming unemployed this autumn.

Mr. Michael Jack, national chairman of the Young Conservatives, claimed at Nottingham that Mr. Bob Cray, Labour MP for Kettering, said yesterday it was a further step to extend

to their future attitude to employment.

Airport licence

The cost of the annual airport licence for the East Midlands Airport near Derby is likely to go up to an estimated £30,000 compared with the present £30,000, according to a report by Mr. Eric Dyer, airport director.

Fewer deaths

The number of deaths in the steel industry fell from 41 to 36 in the past year, spite of the Scunthorpe disaster, in which 11 men died.

Nuclear allegation

Defence Secretary Roy Mason was breaking Labour Party policy behind a cloak of secrecy over a contract to develop tritium in U.S., Germany and Sweden, as ham at the week-end. School leavers were likely to have their MP for Kettering, said yesterday, it was a further step to extend

U.K. capacity to produce nuclear weapons.

Boeing test

The first Boeing 747-300, powered by Rolls-Royce RB211 engines, has made its initial flight. The airline flew a 1 hr. 51 min. over the U.S. Coast.

Pit protest

Villagers in the Vale of Belvoir launched a campaign at the week-end against the Coal Board plans to sink a £100m. pit in the area.

Religious books

Publishers of religious books in the U.K. are losing at least £1m. a year in sales because British authors are selling their manuscripts abroad, particularly in U.S., Germany and Sweden, as Mr. Peter Lard, managing director of publishers Marshall, is

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Courts

Year ended 31 March	1976	1975
Turnover (excluding V.A.T.)	£240,068,000	£228,377,000
Trading Profit	£7,014,000	£4,733,000
Profit before Taxation	£5,411,000	£3,485,000

- * These record results achieved by the group's 103 United Kingdom and overseas stores.
- * Overseas profits from trading in 5 countries amounted to 45% of the group total.
- * Accumulated deferred profit of £7,892,000 will flow automatically into future profits.
- * Net assets, including deferred profit and directors' property valuation, over £25 million.
- * Maximum dividend increase paid. Substantially higher payment when regulations permit.
- * Turnover and profits so far this year are ahead of those in the corresponding period.

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"Recent Issues" and "Rights" Page 29

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White House race starts—officially

BY JUREK MARTIN, U.S. EDITOR

THE U.S. Presidential election season officially opens to-morrow. Mr. Jimmy Carter, the Democratic candidate, who has been straining at the leash for some weeks, begins his campaign with a speech at Warm Springs, Georgia, the site of President Franklin D. Roosevelt's summer home.

President Ford, trailing by a substantial margin in most of the polls, has chosen to avoid the stump until next week, busying himself in the White House and sending surrogates to do his work.

Mr. Carter's strategy is to display the same energy as he unveiled in the long primary months when, starting as an outsider, he tirelessly travelled the country seeking support.

He said in an interview this week-end that he would not confine himself to consolidating his lead in those parts of the country where he is acknowledged to be well ahead.

"I think it's important to us, if I do win, to win with a broad base of support. I would rather have a 6 per cent victory in all the States than have 15 per cent victory in 15 States and lose the rest of them."

This is a reference to the mathematics of the Electoral College, votes which determine the outcome of the election—270

votes in the College are needed to win in November. Mr. Carter is generally expected to lead in the 13 southern states, which account for 147 of the total, while success in California and New York would provide a further 96.

He would only need victories in a couple of other large states which traditionally favour Democrats to be assured of the Presidency.

Mr. Carter might have been tempted to concentrate on his areas of strength if Mr. Ford could lay claim to a similarly powerful base.

But it is generally accepted that the President's appeal is more diffused around the country. According to the polls outside the Southern and border states, he runs Mr. Carter close enough to harbour hopes of success, but in no part of the country, not even his mid-west homeland, is he actually given a lead.

Because he is trailing, the President is clearly planning a lot of late night television debates with Mr. Carter.

Mr. Carter finished 17th in the poll, one position ahead of President Ford. Both even trailed former President Richard Nixon.

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FINANCIAL TIMES

Monday September 6, 1976

WASHINGTON, Sept. 5.

Arabs to hold Lebanon talks in Cairo soon

BY OUR OWN CORRESPONDENTS IN CAIRO AND BEIRUT

FOREIGN Ministers and representatives of Arab League member States, decided in Cairo yesterday to hold a summit meeting during the third week of October to discuss the continuing Lebanese conflict.

Despite a marked intensification in the fighting on the ground, other positive moves towards creating an atmosphere favourable to a settlement were made over the weekend, which witnessed a series of visits by Lebanese leaders to Damascus, and indications of a more flexible attitude on the part of the Palestinian guerrilla movement.

In Cairo, the speed with which nine Foreign Ministers and 11 other representatives reached unanimous agreement on the summit surprised observers.

It will be the first to be held since that in Rabat in October 1974 when Arab leaders recognised the Palestinian Liberation Organisation as "the sole representative of the Palestinian people."

Earlier, Mr. Abdel Halim Khaddam, Syrian Foreign Minister, had consulted with his Egyptian counterpart, Mr. Ismail Fahmy.

Mr. Mahmoud Riad, Secretary-General of the Arab League, said that the late date for the meeting was intended to give Mr. Sarkis and Patriarch Antoun Elias Sarkis, President-elect of Khreish, spiritual head of the Lebanon, "time to arrange Maronite community."

Mr. Denis Howell is not the only man preoccupied with dribbling taps at the moment; the Bank of England, of course, has a different point of view—it would like to turn the tap on rather than off. The gilt market has now been in a kind of limbo for the best part of two months. One suggestion for breaking the impasse is the issue of floating-rate bonds. But there is also a growing interest in the American method of avoiding stagnant markets, by auctioning Government bonds in the same way that the Bank auctions Treasury Bills.

It is not the Bank which has been holding interest rates at their present indecisive level, but investors themselves, for while no-one will buy the market at its present level (or rather, very few) no-one will sell either. The situation seems to illustrate the old British failing of playing too safe: a fund manager is not likely to be blamed for staying liquid, but if he actually takes a view and goes liquid he might get it wrong. The Bank, meanwhile, is reluctant to initiate aggressive selling itself.

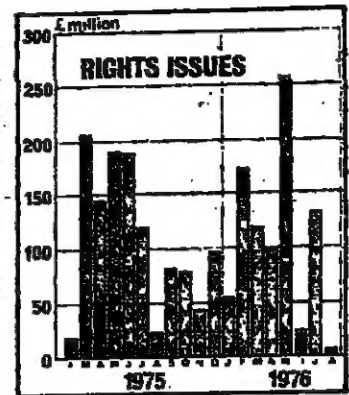
Floating-rate bonds would allow institutions to invest without actually having to take a view, and might also offer a home for some of the altogether excessive reserves of the banking system, which has grown disillusioned with gilts. However, there are still a lot of doubts about this novelty, and in spite of a good deal of study the authorities have still not made up their minds. After all, if the floaters went the way of some recent equity issues the shame would be severe, and it genuinely is difficult to gauge the potential market.

In some ways it might make sense to restrict an initial issue to the banks only: a floater has perfectly obvious attractions for them, and the authorities could then watch the secondary market for a measure of wider demand. However, this would take much too long to tackle the present problem.

The traditional solution is to do nothing. The institutions are holding cash which they intend to invest when the moment looks right; meanwhile, the argument runs, a temporary bulge in the money supply is nothing to worry about. But the trouble with benign neglect

THE LEX COLUMN

When the taps are turned off



After all, the question right from the beginning of the Polygram issue was whether placing of new shares with institutions, with existing holders having the right to up options on the new, was really any different from conventional rights issues. Viewed as a rights issue, heavy (on a three-for-one basis) and at a discount of 14 per cent to the market price, it is scarcely surprising Polygram's existing holders were not very enthusiastic.

But it would be wrong to suggest that Polygram has indulged in a frivolous gambit. The question whether new issue falls really success is fundamental.

The City's new issue machine. The Polygram offer for appeared as an unmitigated disaster, with over 98 per cent of the shares going to underwriters. But Morgan's self-could claim with minor changes to conventional terminology, that all the had been successfully placed with institutions, at a discount of 14 per cent, and outside of almost another 3 per cent had been received at the offer price.

Certainly the lesson could be drawn from the brief and happy new issue season summer that in an increasingly inflexible equity market dominated by a like-thinking herd fund managers the institution need to be more closely graded into the new issue class. There can be a real reference between a Polygram style placing and a rights issue if the institutions are ready to become long-term holders rather than just seek some pin money from underwriting or a count on new shares.

But two things are disquieting about the relationship between issuing houses and the institutions. After all, the real issue failures are not so many those for which public subscription is low, but those for which sufficient sub-underwriting is not found. By conventional sub-underwriting is an encouraging fact that small shareholders had taken up half the shares offered to them in its pre-placed issue through ICF. But looked at the other way round, a rights issue with a 50 per cent "stick" might have been regarded as a bit of a flop.

and equities

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Kaufman to visit U.S. aircraft manufacturers

BY MICHAEL DONNE, AEROSPACE CORRESPONDENT

MR. GERALD KAUFMAN, Minister of State for Industry, will visit the U.S. later this month to discuss collaboration on aerospace programmes with such major manufacturers as Boeing, Lockheed and McDonnell Douglas.

He will be accompanied by senior officials of the Department of Industry, Lord Beswick, chairman of the British Aerospace Organising Committee, who visited the U.S. earlier this year, will be staying in the U.S. for further discussions with European manufacturers.

Mr. Kaufman's trip is seen in the U.K. aerospace industry as one of the most significant developments in the new intensifying battle to decide who will build the next generation of medium-range civil aircraft.

Discussions on this topic are expected to dominate the Farnborough International Air Show this week. The market for the next generation of civil airliners up to 1985 has been estimated at anything upwards of \$30bn, representing more than 1,500 new aircraft. No designs have yet been settled and no commitments made.

Even before his U.S. visit Mr. Kaufman will talk at Farnborough and in London with many U.S. airline and aircraft manufacturing industry leaders who are visiting Farnborough in greater strength than ever.

Every major U.S. and European manufacturer to whom I have spoken admits that it will be making determined efforts to clarify the situation in the next few weeks.

The U.K., while remaining firmly in favour of European collaboration as a basic principle, is nevertheless prepared to keep all its options open. It is keen to win a share of some of the major American programmes which are envisaged for the future, including the Boeing 7X7 medium range aircraft and 7N7 short range ventures.

Mr. Kaufman's objective in the U.S. will be to stress this aspect of U.K. aerospace policy while not committing the U.K. to any specific venture.

His visit is seen as an attempt to counter the effects of the recent unilateral French decision to go ahead with the Mercure 200 airliner design. This has been regarded as cutting across all the previous collaboration discus-

sions held between the U.K. and other European manufacturers. The French plan has met with hostility both on the Continent and in the U.K. and is regarded by many as driving the U.K. in particular into the arms of the U.S.

Strong U.S. counter-measures in the air routes dispute with the U.K. are forecast by Business Week, the American news magazine. According to Mr. Elliot Richardson, U.S. Commerce Secretary, there is the possibility of stopping direct U.K.-U.S. flights.

The U.S. State Department has asked all U.S. airlines to prepare plans should the 30-year-old Bermuda Agreement lapse next June.

Officials from both countries will meet in London this week to try to resolve what Business Week describes as "a near break-down in U.S.-British policy."

The cuts imposed by the U.K. on the number of flights which Trans World Airlines and National Airlines can operate this autumn has been strongly condemned in the U.S. Air Show orders, Page 4 Aerospace survey, Page 11

Emergency meeting on Leyland strikes

BY DAVID CHURCHILL, LABOUR STAFF

THE UNOFFICIAL but powerful joint shop stewards committee at British Leyland's Longbridge plant in Birmingham will hold an emergency meeting this morning. They will consider ways of halting the wave of wildcat strikes which has made 25,000 workers idle and halted all Mini and Allegro production at a cost of more than £1m a day.

The decision to call the 800 Longbridge stewards together was taken by the eight-man works committee at the weekend, following condemnation from the Prime Minister, politicians and union leaders, of the rash of unofficial strikes by small groups who have bypassed established negotiating procedures. The stewards represent all 10 unions at the plant.

But while this morning's stewards meeting is likely to prevent the situation worsening, Leyland's main hopes for a return to normal working this week hinge on a series of meetings being held to-day by the various groups of strikers.

At Longbridge, where 18,000 workers were sent home last week because a strike by 200 toolsetters over a differential in their maintenance allowances also walked out, hopes are high that the toolsetters will accept their shop stewards' advice and return to work pending further talks.

The maintenance men, who walked out in protest at going to their colleagues being laid off by the toolsetters' dispute, are expected to return to normal working if the toolsetters decide to go back.

But a new flare-up is possible at Longbridge following the breakdown of talks late on Friday over a pay claim by 62 rectification engineers whose strike earlier in the week led to 6,000 being laid off at Longbridge. The engineers had returned to work while further talks were held.

At Cowley, Oxford, a meeting of the night shift at Leyland's North Works to-night will decide whether to follow the day shift's decision on Friday and return to normal working after a dispute over the withdrawal of facilities to four Transport and General Workers Union stewards for holding unauthorised meetings. The stoppage cost £3.5m in lost production of Princess and Maxi models.

At Leyland's other main trouble spot the Castle Bromwich body building plant in Birmingham where 4,000 workers were laid off following a strike over demarcation by 250 electricians—no fresh talks are planned. Talks broke down on Friday.

Meanwhile hopes of settlement in the strike by 235 electricians at the Lucas Group in Birmingham, which has substantially slowed component supplies to Leyland, hinge on a meeting to-day between the electricians' stewards and management.

Management at Ford's plant in Halewood, Liverpool, are having more talks with stewards representing about 80 paint shop workers whose dispute over pay while laid off has stopped work on the last two night shifts, losing more than 600 Escorts and Capris.

Industry activity revival continuing steadily

THE REVIVAL in industry activity is continuing steadily but surely, despite some of the recent Government statistics on stocks and exports, according to the latest Confederation of British Industry monthly trends inquiry for August.

Replies to the inquiry, taken between the 3rd and 18th of last month, show that some 43 per cent of respondents expect the volume of output to rise over the next month, compared to only 8 per cent, expecting a downward trend and 47 per cent, expecting the trend to remain the same.

Exports again appear as the major cause for optimism, with nearly half the respondents reporting an increase in export orders over the last four months and only 15 per cent, reporting a decline.

By far the majority—some 75 per cent—expect, on the other hand, prices to rise, with a rather greater balance than in the last survey.

Taken together, the monthly surveys of the last 10 months, which have tended to prove a reliable guide to trends in the past—show that the recovery in output has spread across a surprisingly wide range of industries, including the capital goods sector.

The two main vehicles for the improvement—which is still from a very low base—are clearly export orders, helped by the devaluation of sterling as well as the earlier recovery of other major industrial economies, and an end to destocking.

On both these questions, the CBI tends to take a slightly different view of trends than the recent government pessimistic National Institute report.

Continued from Page 1

Hopes for Namibia

is continuing to insist that the release of SWAPO prisoners from South African jails, would be determined by Namibians themselves, he is thought ready to send a South African delegation to take part in enlarged constitutional discussions, probably in Geneva, which would include not only participants in the current South Africa-sponsored Turnhalle talks in Windhoek, the further visit to Africa, Namibian capital, but also the SWAPO external leadership.

The South African Prime Minister is also believed ready to accept a U.N. presence in Namibia, although that, together with the withdrawal of South African troops from Namibia and prepared to be flexible.

Weather

Cloudy, some rain; sunny spells.

London, E. Anglia, Midlands, Channel Isles, S. Wales, S.W. S.E., Cen. S., E. Cen. N. England. Dry, rather cloudy, sunny spells later. Wind N.W. Light. Warm. Max. 20-22C (68-72F).

N. Wales, N.W. England, Lakes, N. Ireland, S.W., N.E., N.W. Scotland. Mainly cloudy, some rain. Hill fog. Near normal. Max. 17C (63F).

N.E. England, Borders, Rest of Scotland. Mainly dry. Bright or sunny intervals. Warm. Max. 19C (66F).

Outlook: Mostly dry and warm. Sunny spells in S., changeable in N. Lighting-up: London 20.15, Manchester 20.27, Glasgow 20.40.

BUSINESS CENTRES

City	Y-day	Mid-day	Y-day	Mid-day
Alexandria	20	20	20	20
Amsterdam	20	20	20	20
Antwerp	20	20	20	20
Bombay	20	20	20	20
Buenos Aires	20	20	20	20
Calcutta	20	20	20	20
Canton	20	20	20	20
Cebu	20	20	20	20
Hankow	20	20	20	20
Hong Kong	20	20	20	20
Kobe	20	20	20	20
London	20	20	20	20
Lyons	20	20	20	20
Manila	20	20	20	20
Medan	20	20	20	20
Osaka	20	20	20	20
Paris	20	20	20	20
Rangoon	20	20	20	20
Shanghai	20	20	20	20
Singapore	20	20	20	20
Tokyo	20	20	20	20
Yokohama	20	20	20	20

HOURLY WEATHER

City	Y-day	Mid-day	Y-day	Mid-day
Alexandria	20	20	20	20
Amsterdam	20	20	20	20
Antwerp	20	20	20	20
Bombay	20	20	20	20
Buenos Aires	20	20	20	20
Calcutta	20	20	20	20
Canton	20	20	20	20
Cebu	20	20	20	20
Hankow	20	20	20	20